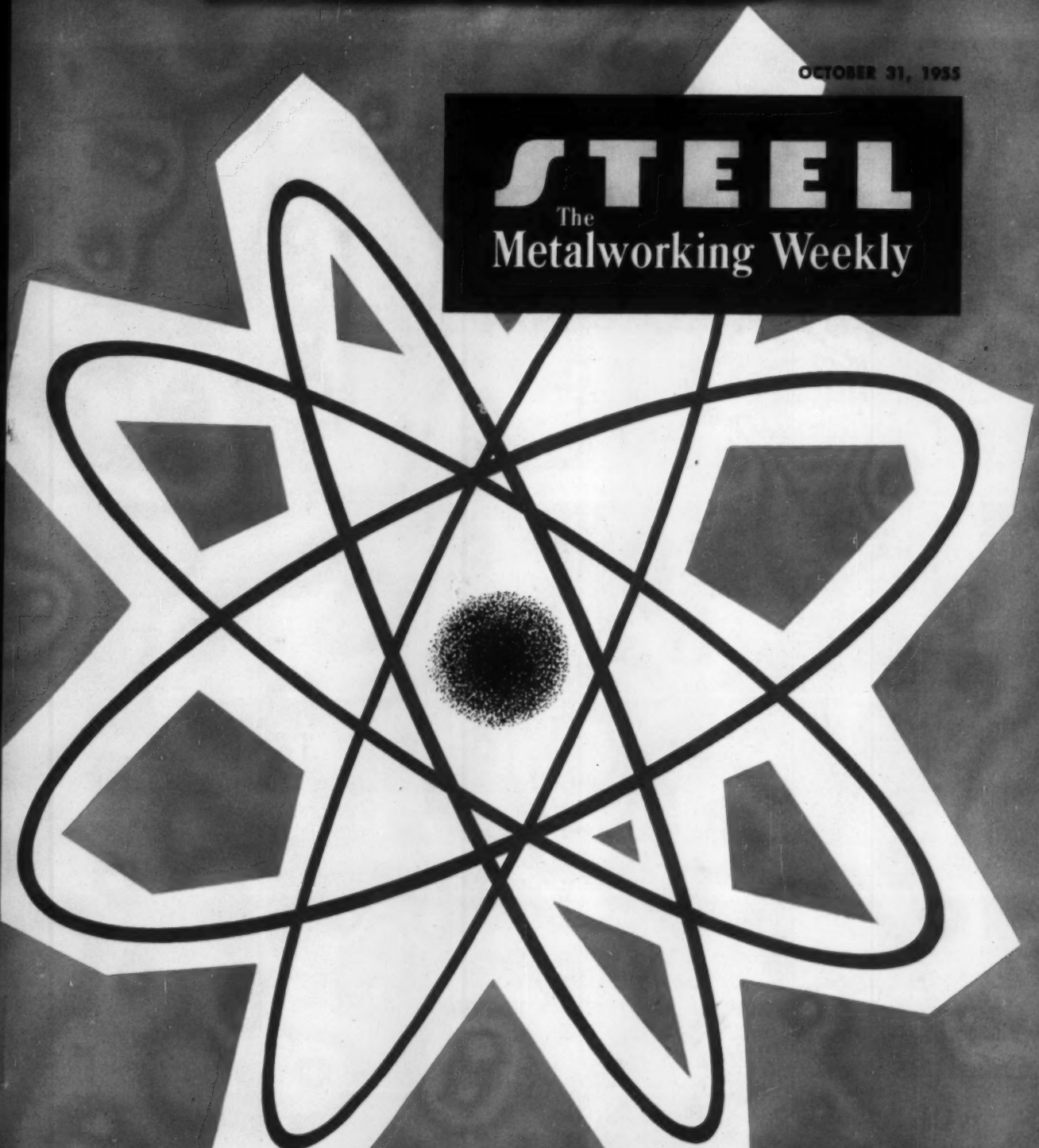
OCTOBER 31, 1955

STEEL

The Metalworking Weekly



ATOMS MEAN BUSINESS

$700 million a year in components by 1963

—page 66

✔ Economic Prospects for '56 . . . page 35

✔ Flat Springs Shop for Markets . . . page 101

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HEAVY LOADS

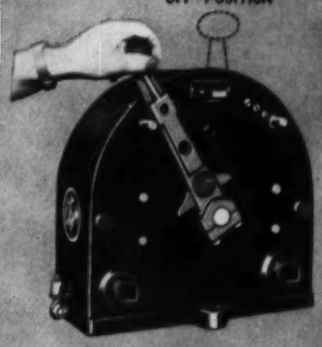
Here's Where EC&M CONTROL Gives Unexcelled Results

The EC&M Wright Dynamic Lowering Circuit Controller for crane-hoists is well known for its ability to permit accurate, short movements when spotting a load. The operator has complete control of all lowering speed-points. In setting the cope with this 125-ton crane, quick response through fast brake release enables the operator to close the mold carefully—with a minimum number of movements which maintenance men recognize as a contributing factor to reduced up-keep. The Wright Circuit is safe—specify EC&M Crane Control.

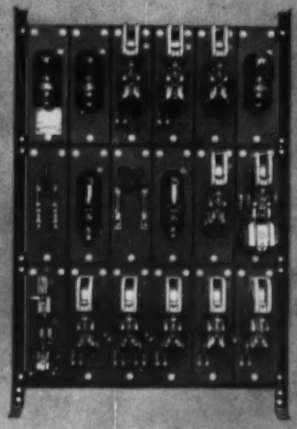
WRITE FOR BULLETIN 921

Photo—Courtesy, Cleveland Crane & Engineering

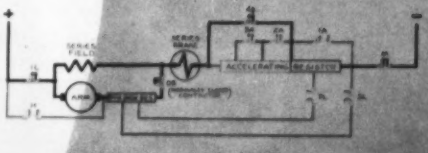
SPOTTED QUICKLY, SAFELY



Speed-control Master Switches have short throw—narrow width—and are convenient for the operator to use.



The Wright Dynamic Lowering Circuit Controller (with protection) for crane-hoists.

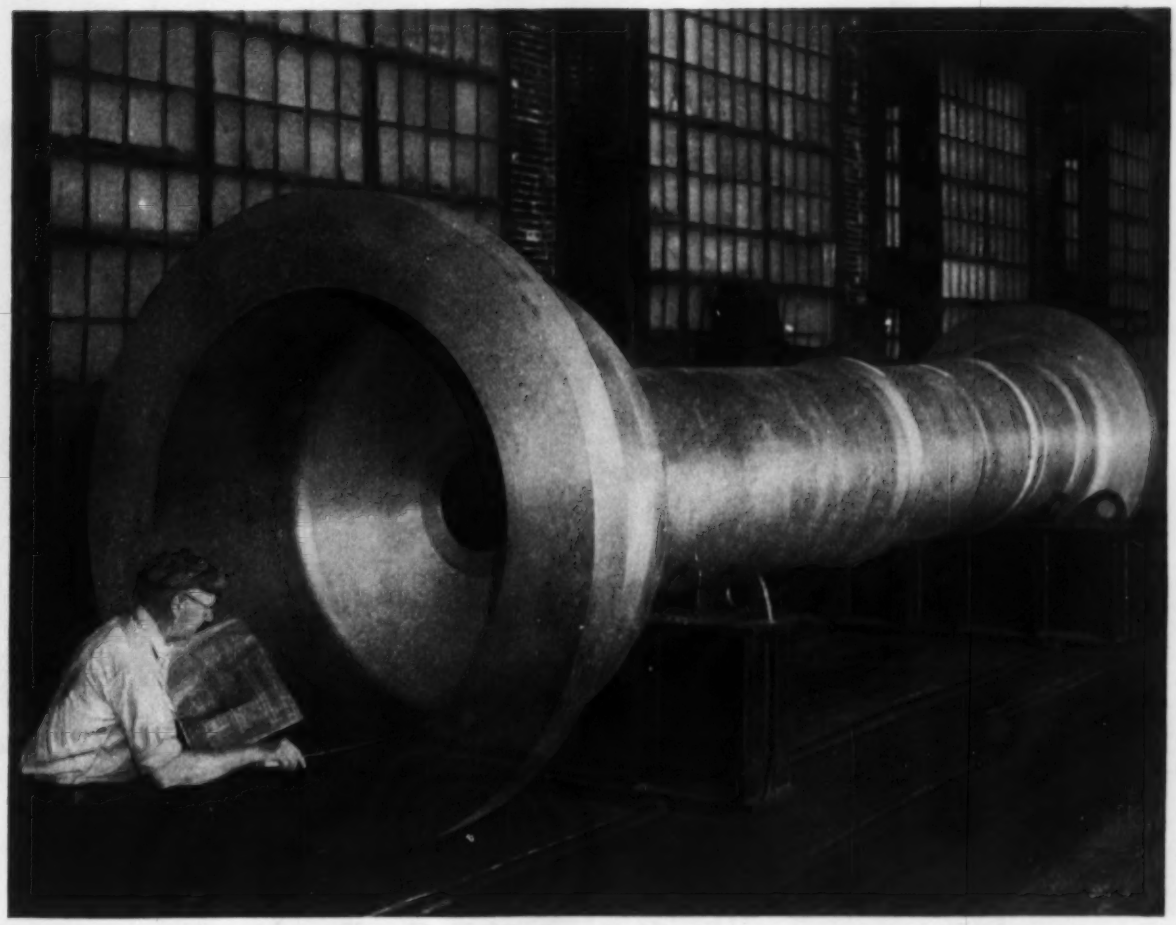


First point lowering connections put all the current from the line through the brake for fast release.

E C & M

THE ELECTRIC CONTROLLER & MFG. CO.

4498 LEE ROAD • CLEVELAND 28, OHIO



It would do credit to a sculptor

This beautifully symmetrical shaft is the product of expert steelmakers, forging men, and machinists, working as a team. Of carbon-vanadium steel, it has the contours of a delicate vase or a sculptured column.

But don't let appearances deceive you. Despite its stylish lines the shaft is intended for heavy-duty work in a hydroelectric plant. It weighs 39 tons, and the diameter of the large flange is 78 in. The main body has an OD of 35¼ in. The hollow part of the "bell"—the end nearest you—had to be machined out, leaving a cavity 54 in. in diameter x 34 in. deep. That took some doing.

In fact, the whole job took some doing. It required the most careful forging, treating, and machining—and before that, *planning*. It's the sort of thing that our engineers and shop men always look forward to.

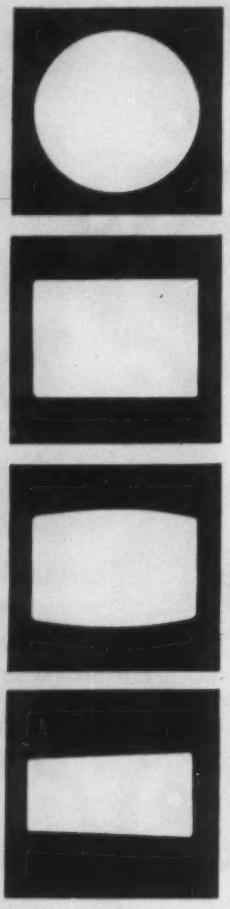
We're showing it merely as a sample of what Bethlehem does in heavy forgings. But please don't get the impression that we only handle big jobs. If you require smaller pieces, we're all set up to make them for you. Even the smallest ones—tiny drop forgings that only weigh a pound or so.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Ball Bearings

Cylindrical Roller Bearings

Spherical Roller Bearings

And now

Tyson Tapered Roller Bearings*

The broadest product line in the anti-friction field.

SKF—and its field engineers—are now adding Tyson Tapered Roller Bearings to their recommendations.

Constantly working to broaden the SKF line—to make "the right bearing in the right place" a watchword throughout industry, SKF has recently introduced new lines of pillow blocks, styles and sizes of Max type ball bearings, the improved Type "C" Spherical roller bearing.

And *now* SKF offers Tyson Tapered Roller Bearings.

This means that from SKF you get the broadest range of types and sizes of anti-friction bearings *and* the most extensive anti-friction experience.

More today, than ever before, dealing with SKF Field Engineers assures you of the right bearing in the right place. 7646

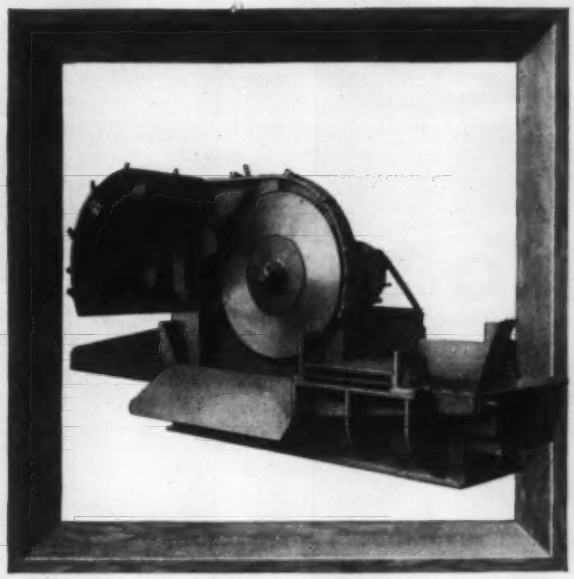
*Manufactured by TYSON BEARING CORP., affiliated with SKF Industries, Inc. as a subsidiary.

SKF®

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.,
manufacturers of SKF *and* HESS-BRIGHT® *bearings.*

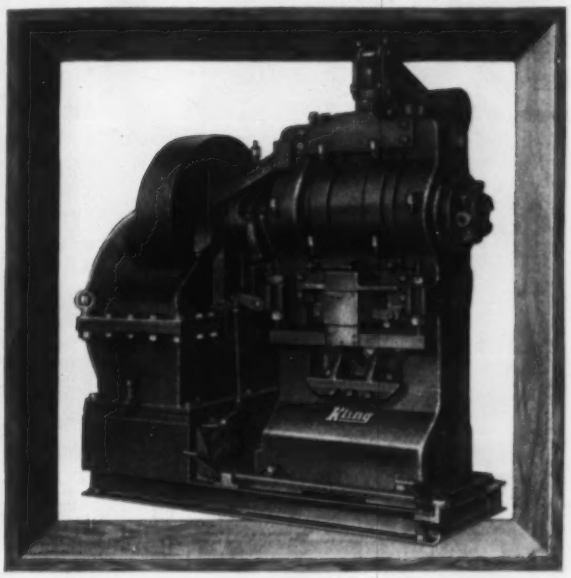
Friction Sawing



KLING FRICTION SAWS... 10 SIZES
(Size 4200 Illustrated)

Capacity of this Saw: All standard structural steel sections; all standard steel rails; most steel pipe sections, and many solid sections.

Guillotine Shearing



KLING GUILLOTINE SHEARS... 5 SIZES
(No. 4 Illustrated)

Tonnage Ratings			
#1 Guillotine	85 Tons	#3 Guillotine	175 Tons
#2 Guillotine	125 Tons	#4 Guillotine	250 Tons
		#6 Guillotine	650 Tons

Both Attain New Popularity Due to Recent Kling Improvements!

KLING FRICTION SAWS: There are two big reasons for today's renewed popularity of these high-speed saws. *First*—a growing recognition of the exclusive advantage of friction sawing . . . faster cutting of steel shapes (structurals and solids) without changing setup. *Second*—new KLING developments providing semi-automatic control for controlling the speed of the carriage, and other added advantages in line with today's automation trend. KLING Friction Saws also reduce the "cost per cut" to a new low, and one KLING Saw will take the place of several saws of other types, as users in "the best of companies" will verify. Ask for list of users in your industry; also, send for Bulletins 4200 and 9200 giving full details.

Both Are Winning More and More "Production Oscars"

KLING GUILLOTINE SHEARS have been completely redesigned to assure users an even wider range of capacities and still sturdier construction for additional years of service. Some of the new features of the machine illustrated are . . .

Power Drive and Speed Reduction unit is a fully enclosed, welded steel housing containing precision cut, heat-treated steel gears.

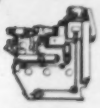
The Shear Unit has a ductile iron frame of exceptionally high tensile strength. Other features are shock resistant, alloy tool steel blades, new type guarding, replaceable hardened steel wear strips, heat-treated alloy steel dual pintle blocks, T-slots in steel slide, modern lubrication system.

For data on all the various Kling Metal Fabricating Machines, write today for your copy of the New Complete Line Bulletin 100.

Since 1892

KLING BROS. ENGINEERING WORKS
1320 N. KOSTNER AVE. • CHICAGO 51, ILL.
Export Distributor: Simmons Machine Tool Corp., 50 E. 42nd St., New York 17, N. Y.

Kling


Rotary Shears

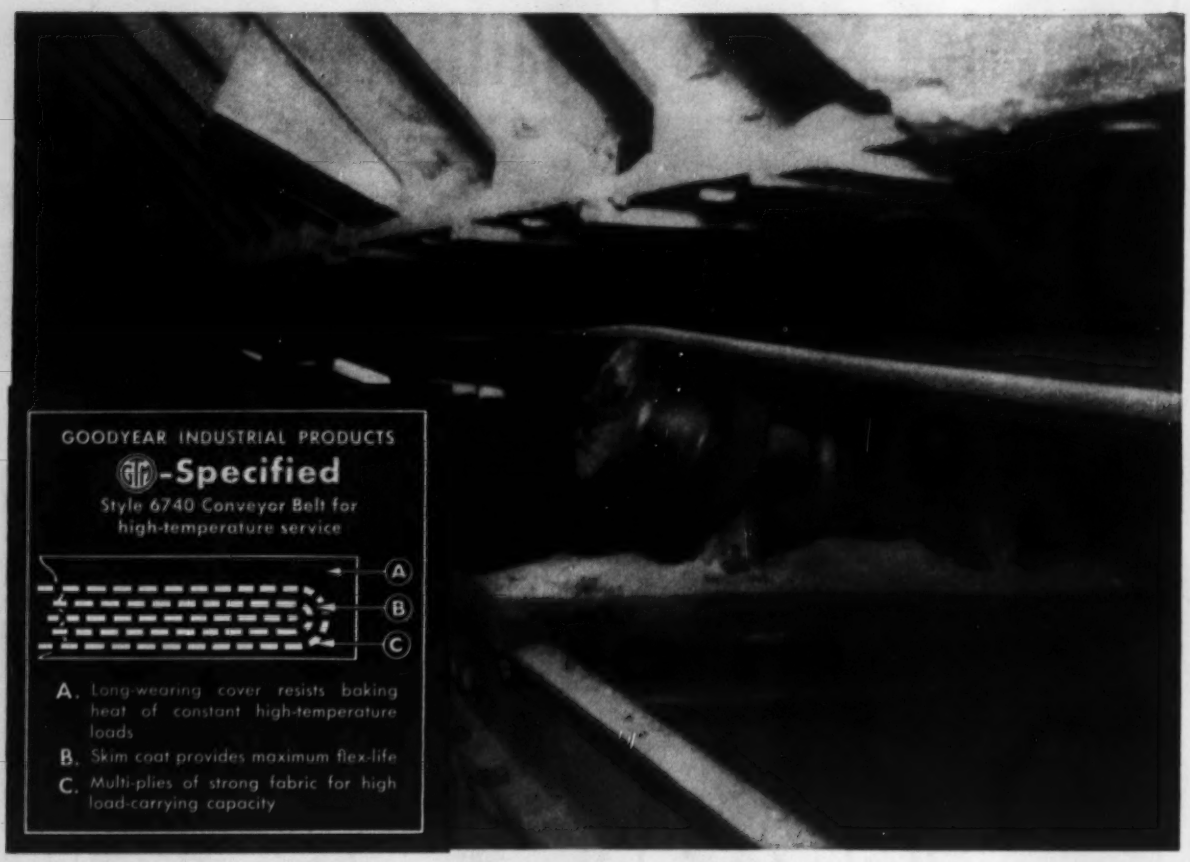
Double Angle Shears

Punches

Combination Shear, Punch & Coper

Angle Bending Rolls

Plate Bending Rolls


GOODYEAR INDUSTRIAL PRODUCTS
G-Specified
Style 6740 Conveyor Belt for high-temperature service
A
B
C
A. Long-wearing cover resists baking heat of constant high-temperature loads
B. Skim coat provides maximum flex-life
C. Multi-plies of strong fabric for high load-carrying capacity

Conveyor life doubled

hauling 230° F. silica sand

HOT PROBLEM for a silica sand processor was short conveyor life. Belts carrying 230° F. sand were cracking, wearing, pulling apart because of high heat and abrasive dust. Two makes of belts were tried but each failed after one year's service.

Looking for an answer to their problem, the company asked the advice of the G.T.M.—Goodyear Technical Man. He recommended a Style 6740 belt with the specially compounded rubber cover that would not harden or crack under the baking heat, would resist the effects of abrasive dust.

RESULT: The Goodyear conveyor is still in service after two years—shows no sign of wearing or failing. And savings of 30 man-hours of maintenance, to date, have gone a long way towards paying for the belt.

Bulk materials of almost any kind can be carried almost anywhere—at less cost—by Goodyear conveyors. For help in your materials-handling problems call in the G.T.M. Contact him through your Goodyear Distributor or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the Yellow Pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

STYLE 6740 CONVEYOR BELTS by

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

STEEL
The Metalworking Weekly

OCTOBER 31, 1955

Vol. 137 No. 18

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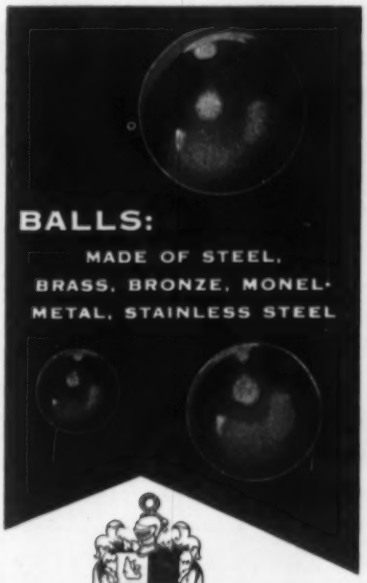
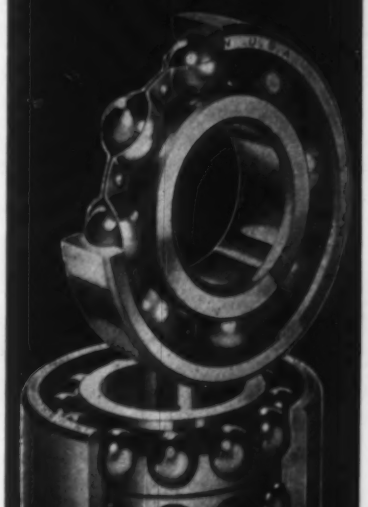


HOOVER

The Aristocrat of Bearings

BALL BEARINGS:
AMERICA'S ONLY BALL BEARING WITH HONED RACEWAYS



HOOVER BALL AND BEARING COMPANY
ANN ARBOR, MICHIGAN

Coming

Nov. 14

IN

STEEL

Keep Your Product Growing

A die casting company went to a potential customer and offered: "Let us redesign your product." The customer got a better product. The die casting company had a new client. While your sales may have jumped 50 per cent since World War II, remember that the metalworking industry's sales have doubled in the last ten years. STEEL will show you how to keep your product growing through increased emphasis on product design and the development of new customers and markets.

behind the scenes

Distinguished Guests

Earlier this year STEEL's editor, Irwin H. Such, undertook an extended tour of industrial Germany, in the course of which he was introduced to and entertained by many modern industrial giants. Last week Irwin had the chance to return some of the favors. Dr. Fritz Hardach, general manager, Huetten und Bergwerke Rheinhausen AG (Krupp coal and steel properties); Dr. Rudolf W. Rasch, managing director, Ilseder Huette AG; and Dr. Herbert M. Gross, economic consultant and STEEL's German correspondent, came to town.

Irwin gave a reception and press conference in their honor at the Union Club. The German business executives are on a State Department visit to tour local industry.

Additional guests at the reception included industrial representatives, members of the press and representatives of The Penton Publishing Co. Speeches were made in English and German, and the three doctors expressed their great interest in American enterprise.

Dr. Hardach revealed that the Krupp interests are still negotiating with representatives of Cyrus S. Eaton, Cleveland industrialist, about buying medium grade iron ore shipped from the Ungava region of northern Quebec. Some of the reporters present recalled that Ungava is much nearer the Arctic Circle than Eaton's thought paradise, Pugwash, which sits on the south shore of the Gulf of St. Lawrence, but they didn't mention it. Maybe the thought of translating Ungava and Pugwash into German chilled their enthusiasm.

The German doctors will have an extra occasion to remember Cleveland, because Heinz von Koschembahr, assistant editor, took them to a symphony concert the night following the reception.

Missed by Whiskers

Last week a letter was delivered to STEEL. That is not unusual, of course; crates of letters are delivered to STEEL every day. This one, however, was marked PERSONAL, but instead of bearing the name of the addressee over the company address, it bore a portrait excised from a snapshot. The handsome countenance that stared from the letter at the young gentlemen in the mailroom was about ¾-in. from the top of the carefully combed head to the tip of the determined chin. The young gentlemen stared right back at it.

"Who," inquired one of the young gentlemen, "is he?"

"Ain't nobody like that around here," said another.

"Get a load of that mustache," offered a third.

So they sent the letter with a bundle of editorial mail to the ninth floor, where it was established that the envelope must have been addressed to James K. Gillam, STEEL's advertising representative in Cleveland, mostly because the picture bore a striking resemblance to Jimmy when he sported a mustache.

When this information was passed along to the mailroom, there was a silence. Then somebody offered an excuse. "How were we to know? We didn't know this guy before he got shaved."

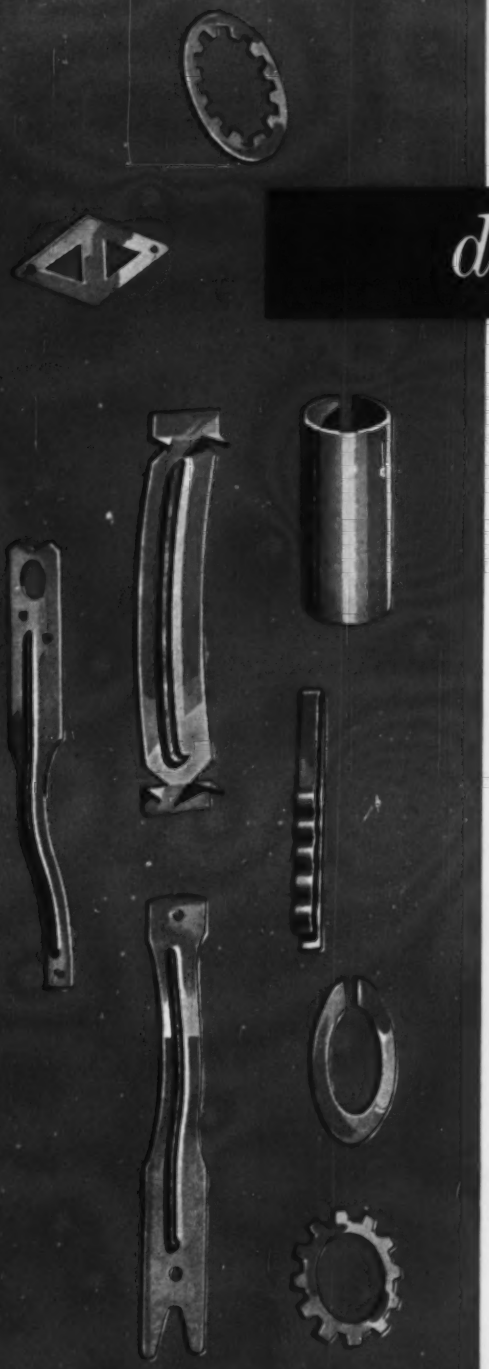
What's Your Guess?

Proposing puzzles, limericks, anagrams, cryptograms and the like in a column like this is suggestive of audience participation. Sometimes we wonder if you tire of them, but shucks, neighbors, ain't no harm in a little quizzical informality.

Here's a quiz that should have been pied after it was set, but go ahead, answer it anyway. All contestants will receive some left-over portraits of a gambler and a banker. 1. How much does a bull moose weigh? 2. Define metal. 3. What is a Yuga? 4. What is the price of a ton of high-carbon ferrotitanium? 5. Who was Hathor? 6. In what city were bolts and nuts recently substituted for rivets in skyscraper construction? 7. What company will design the stern of the first atomic surface ship? 8. How many fins has a cod? 9. Who was Ptah? 10. How long is a big whale?

Shrdlu

(Metalworking Outlook—Page 29)



dependable!

WEIRTON

high carbon strip
cold-rolled spring steel

for high-speed blanking or forming

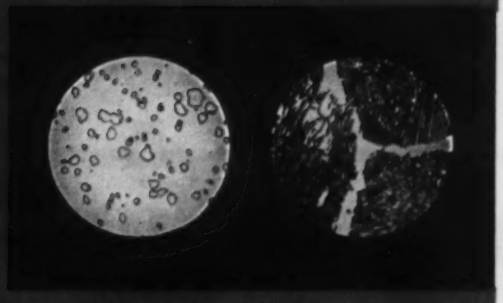
Where high fatigue-resistance is a principal factor, Weirton cold-rolled spring steel furnishes high carbon strip in the consistent uniformity necessary to meet the most exacting requirements of a wide variety of products. The close manufacturing control featured at Weirton results in several unique and highly desirable qualities—such as accurate response to heat treatment . . . uniformity of gauge and width . . . uniform chemical and physical properties . . . exact consistency of grain structure . . . controlled decarburization limits.

Pearlitic and spheroidized structures are available with desired chemical analyses and for specific heat treating and hardness. When you call Weirton you call for easier blanking and cold forming. And, at Weirton, you get what you call for.

WEIRTON STEEL COMPANY

Weirton, West Virginia

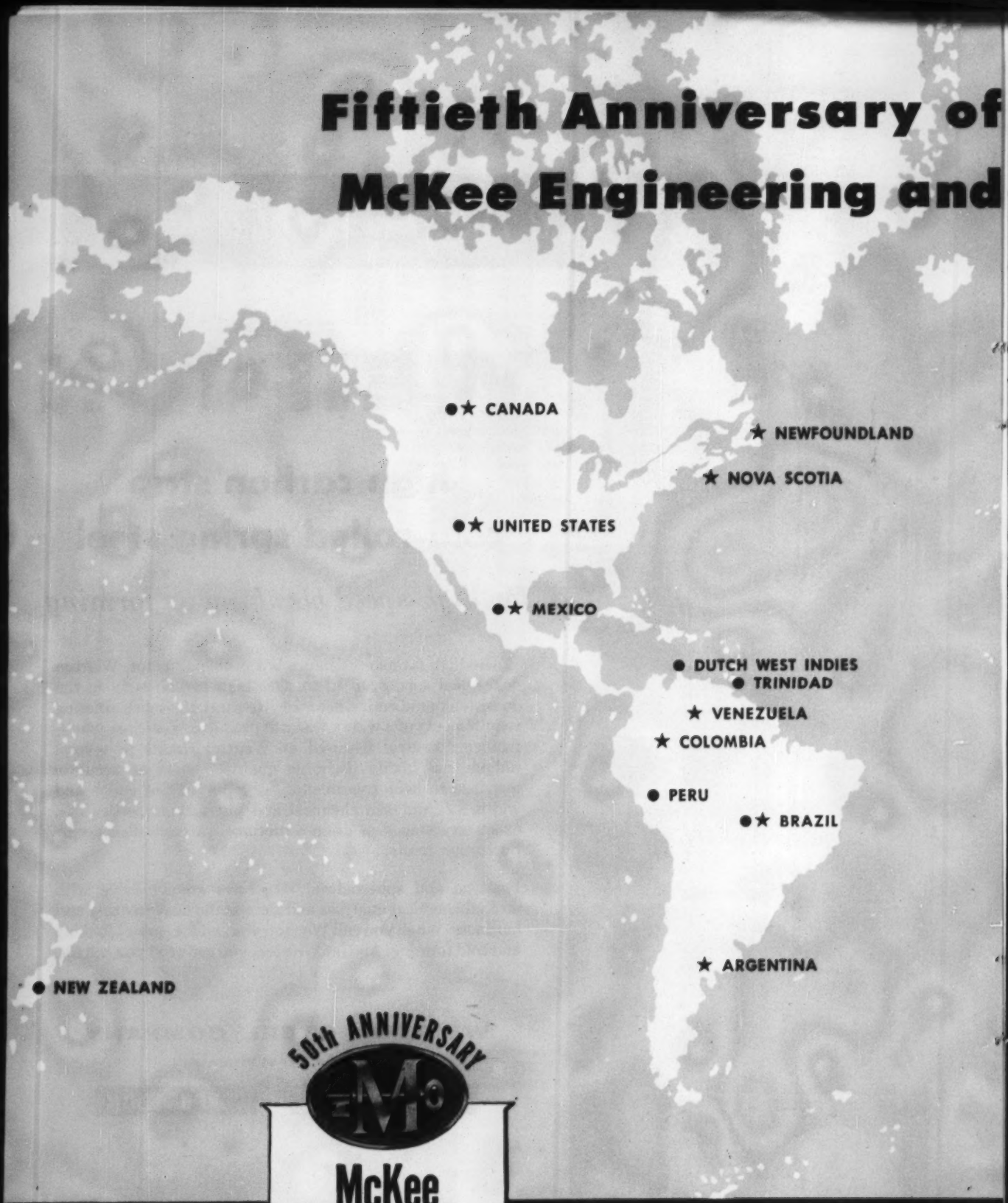
NATIONAL STEEL CORPORATION



The photomicrograph on the left illustrates Weirton high carbon strip that has been spheroidized and annealed—soft and ductile—ideal for cold-forming operations. The one on the right shows the pearlitic steel structure, temper-rolled in controlled hardness and strength for clean, economical blanking procedure.

WEIRTON STEEL COMPANY

Fiftieth Anniversary of McKee Engineering and



50th ANNIVERSARY

McKee Engineering Services

Arthur G. McKee &

HEADQUARTERS
McKee Building
2300 Chester Avenue
Cleveland 1, Ohio

specialized, world-wide Construction Services

IN A HALF-CENTURY of engineering and construction Arthur G. McKee & Company have executed more than 2500 contracts for projects having a combined erected value of more than a billion dollars.

★ **IRON AND STEEL PROJECTS,** including completely integrated plants, blast furnaces, blast furnace components, steel-making plants and ore beneficiating units.

● **PETROLEUM AND CHEMICAL PROJECTS,** including complete refineries, distillation, cracking, reforming, alkylation, polymerization, desulfurization, etc., and chemical and petro-chemical plants in the fields of ammonia, oxygen, sulfur and sulfuric acid.

Company • Engineers and Contractors

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Union, New Jersey
Washington, D. C.

ENGLAND
British Representatives of Metals Division
Head, Wrightson & Co., Ltd.
Thornaby-on-Tees

CANADA
Arthur G. McKee & Company of Canada, Ltd.
372 Bay Street
Toronto, Ont.

Marshall-Richards vertical inverted tube blocks in operation for 2 years at Yorkshire Copper Works Ltd., Leeds, England. Typical drawing cycle, from 1.875″ o.d. and .094″ wall thickness to .322″ o.d. and .028″ wall thickness, in 8 passes. Drawing speeds from 225 to 2,025 fpm available.

An Addition . . . That Multiplies Our Ability To Serve You

Fenn will now build and sell, on this side of the Atlantic, the outstanding wire and tube drawing machines of Marshall-Richards Machine Company, Ltd., of England.

You can now meet your every wire and tube fabricating need from one source, because these machines perfectly supplement Fenn's wire shaping mills, rolling mills, Turks Heads and swaging machines.

The Fenn Manufacturing Company

555 Fenn Road,
Newington, Connecticut

•

Wire Shaping Mills
Precision Rolling Mills
Turks Heads
Swaging Machines

FENN

LETTERS
TO THE EDITORS

Lessons in Management

Congratulations on your 1955 Management Series! Each installment is an important lesson in itself. I would appreciate tear sheets of all available reprints in the series.

H. W. Olander
Research Division
Allis-Chalmers Mfg. Co.
Milwaukee

Holding of Middle Man

We would appreciate three copies of the story, "Middle Management: How To Hold It" (Oct. 17, page 73).

G. H. Jackson
Vice President-Purchasing
Modine Mfg. Co.
Racine, Wis.

Will you please send three copies?

J. P. Burchfield
Market Research & Sales Promotion
John A. Roebling's Sons Corp.
New York

I would appreciate three copies.

C. M. Squarcy
Superintendent
Blast Furnace Dept.
Indiana Harbor Works
Inland Steel Co.
E. Chicago, Ind.

Handy Little Tool

STEEL's Hardness Converter is a wonderful little chart. We want to supply key men with them and we would like to order 12 of these handy little tools.

F. Milton Fisher
Office Manager
Massachusetts Steel Treating Corp.
Worcester, Mass.

Story Helps Canadian

We would appreciate receiving three copies of the article, "Big Expansion in Steel" (Sept. 5, page 41). It will be helpful in connection with our own projections on Canada's economic growth.

D. Fullerton
Royal Commission on
Canada's Economic Prospects
Ottawa, Canada

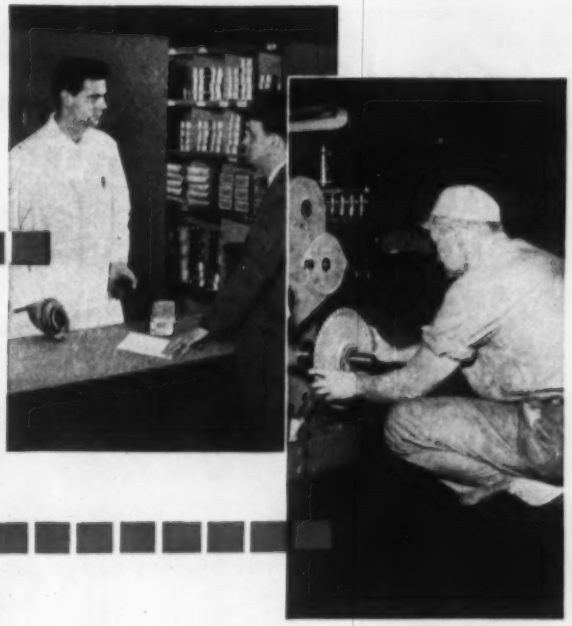
Dollar Signs for Eyes

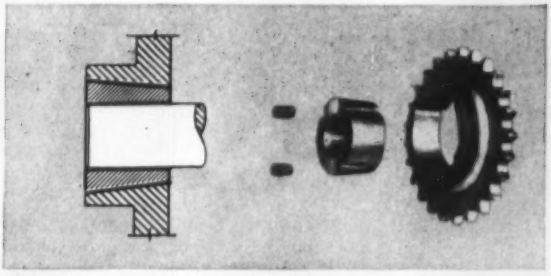
Being one of those people with dollar signs for eyes, I found the article, "Value Analysis: Equal or Better Performance at Lower Costs" (Sept. 19, page 101), extremely interesting. It was so comprehensive and vividly descriptive that I would like three re-

(Please turn to page 12)

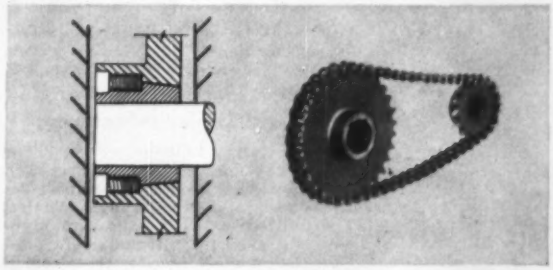
ORDERED today

OPERATING today

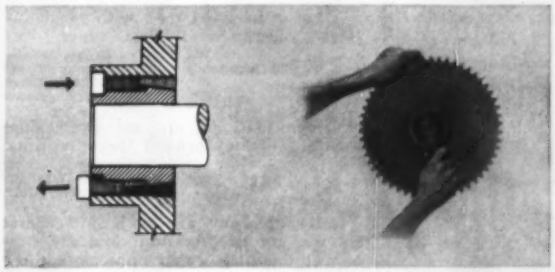




FULL BEARING . . . POSITIVE GRIP. Contact extends the entire length between bushing and shaft, sprocket and bushing. Uniform compression on shaft provided by tapered construction.



SAFE AND COMPACT. Flush mounting requires minimum shaft space and bushing requires no more length than sprocket hub. No projecting flanges or bolts—all cap screws are fully recessed.



EASY TO INSTALL AND REMOVE. Setscrews force and hold bushing in tapered bore of sprocket, clamp it tightly onto shaft. Turning setscrew in removal hole quickly releases bushing.

LINK-BELT roller chain taper lock sprockets require no reboring or other machining

HERE'S the simplest, most economical method of installing roller chain sprockets. Link-Belt roller chain taper lock sprockets are available for immediate delivery in every industrial area, in sizes from ½ to 2-in. pitch. Bushings are stocked in bore increments of 1/16 in. for shaft sizes from ½ to 4-in. diameters. No delay for sprockets to be rebored.

Teeth are precision cut in conformance with ASA standards, accurately spaced for smooth chain action. Uniform, true tooth surfaces provide full contact with chain rollers, assuring maximum operating life.

Your source is the Link-Belt factory branch store or authorized stock-carrying distributor. Be sure to ask for new Book 2649 listing all available stock sizes.

LINK-BELT

ROLLER CHAIN AND SPROCKETS

19,047

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 15); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

Ready-Made Sales

WANTED—
In-State Suppliers of

- Industrial Chemicals
- Abrasives
- Lumber and Wood Products
- Electronic Equipment Parts
- Aluminum Extrusions
- Metal Stampings, Malleable Iron and Light Metal Castings
- Paper Products
- Rubber Products
- Industrial Ceramics
- Textile Mill Supplies

The vigorous industrial growth of North Carolina has developed bright opportunities for additional companies which can furnish supplementary parts and supplies.

Quantity buyers within the State provide a very desirable market for new North Carolina producers of a wide variety of needed items.

A survey of many companies operating in North Carolina has provided definite knowledge about supplies and parts which could advantageously be purchased from new in-State producers.

The partial list of supplemental parts and supplies shown here is representative of a market of better than $200,000,000. If your company is interested in establishing operations in North Carolina to supply any part of this awaiting market, get in touch with Ben E. Douglas, Director, Dept. of Conservation and Development, Raleigh 10, N. C.

The new brochure "Industrial Location Factors" will be sent free upon request

Friendly North Carolina Where Industry Prospers

LETTERS

(Concluded from page 10)

prints to pass on to interested persons in our organization.

Ralph S. Ricketson
Value Analysis Specialist
Small Aircraft Engine Department
General Electric Co.
West Lynn, Mass.

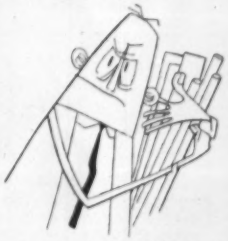
We were much impressed with this article. There are several of us here serving in the function described, and all the situations discussed hit pretty close to home. May we have 12 copies?

D. E. Dean
Welding Engineer
Methods & Time Standards Dept.
Cost Reduction Committee
Jeffrey Mfg. Co.
Columbus, O.

Your coverage on the entire value analysis picture is by far the best I have seen in any article.

Adolph Ruediger
Director of Purchases
Carrier Corp.
Syracuse, N. Y.

Aluminum Protection



Would you send additional information on the ways of preventing aluminum corrosion, as stated in the Technical Outlook column of Sept. 19, (page 111).

James F. Johnson
Plant Manager
Qualheim Inc.
Racine, Wis.

• *Write Dr. Joseph E. Draley, senior chemist-metallurgy division, Argonne National Laboratory, P. O. Box 299, Lemont, Ill.*

Good Deal for Manufacturers

I have just read your article, "How To Tame Wildcats" (Oct. 3, page 37). Our company would like to furnish department heads with a copy. We feel it is well written and deals with problems which confront manufacturers today. We would appreciate three copies.

R. R. Pickering
Personnel Manager
Hegewisch Ordnance Division
U. S. Industries Inc.
Chicago

Your article was read with much interest. Please send three copies.

Ernest Wilson
Superintendent, Blast Furnace Dept.
Republic Steel Corp.
Youngstown

Congratulations on an exceptional article. Please forward three reprints.

Charles N. Clark
689 N. Eighth West St.
Provo, Utah

This excellent article is of general interest for my assistant and my personnel man. I would appreciate three copies.

A. O. Rom
Plant Superintendent
Locke Mfg. Co.
Lodi, O.

All-stainless kitchen, Carlton House, Pittsburgh, Pa.

Stainless shines in kitchen of Pittsburgh's Gateway Plaza.

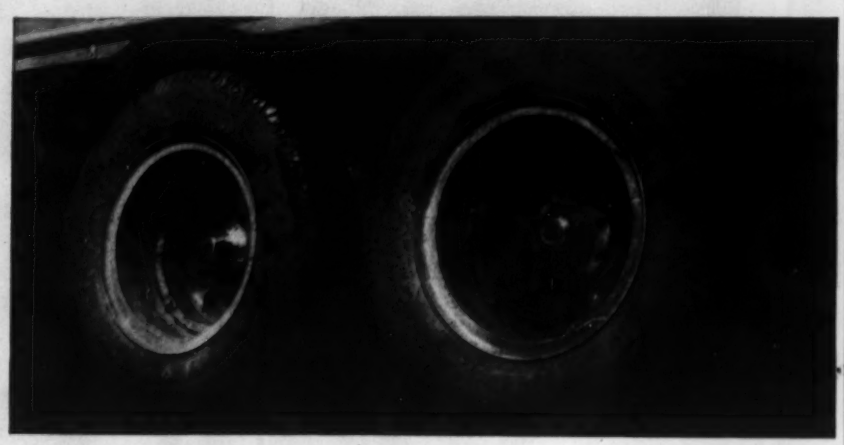
for spotless service . . . make it Crucible Stainless Steel·

Leading fabricators like Ershler & Krukin, Bayonne, N. J., and their clients, know that for attractive, spick-and-span kitchens *all-stainless* equipment is the answer. And there's good reason for their choice of stainless steel. For *Crucible stainless* is a cinch to clean . . . foods can't discolor it . . . and its bright, smooth surface resists nicks and scratches through years of hard use. And it's easily fabricated by any standard method.

BUT THE ADVANTAGES OF STAINLESS STEELS AREN'T LIMITED TO KITCHEN EQUIPMENT. Manufacturers of everything from airplanes to zippers find it a perfect metal for many applications. You will, too. Let Crucible help you make the most of these versatile metals. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America



GRIP OF STEEL. The steel reinforcing of the tire bead, upon which pneumatic rubber tires are built and which grip auto wheels securely, is made of high-quality CF&I-Wickwire Pneumatic Tire Bead Wire.

from tires to jar tops . . . wire works wonders

WELL PRESERVED. The wire closure on these glass preserving jars holds the tops tightly, maintaining the air-tight seal. This clamp is made from CF&I-Wickwire Galvanized Clamp Wire.

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MAKES WIRE FOR

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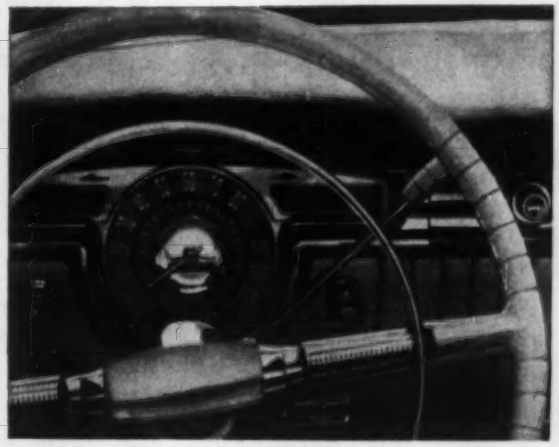

FLEXIBLE POWER. Speedometer cable is made of criss-crossed layers of CF&I-Wickwire Flexible Shaft Wire.

SHADES OF NIGHT. The curtain springs in window shade rollers are made from tempered CF&I-Wickwire Spring Wire.

ALL WRAPPED UP. CF&I-Wickwire Baling Wire is used in baling hay, straw, and other bulky farm products.

TO PLUMB THE DEPTHS. An invaluable part of every plumber's kit is his plumber's snake made of CF&I-Wickwire Snake Fishing Steel Wire.

It's no wonder that wire is all-important in hundreds of different industries...for its properties can be custom-tailored to just about any need. Are you concerned with assembly work, manufacturing, processing? Do you require wire that's fine or coarse, hard or soft, round or shaped? Then the chances are excellent that a CF&I-Wickwire Wire will more than fill the bill.

CF&I-WICKWIRE, with over a century of experience in the manufacture of wire, is always ready to serve you from plants conveniently located from coast to coast. Call or write our nearest district sales office for detailed information.

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3147

...because they went to their doctors in time

Many thousands of Americans are being cured of cancer every year. More and more people are going to their doctors *in time*. That is encouraging!

But the tragic fact, our doctors tell us, is that every third cancer death is a needless death...*twice* as many could be saved.

To learn how to head off cancer, call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society

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You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

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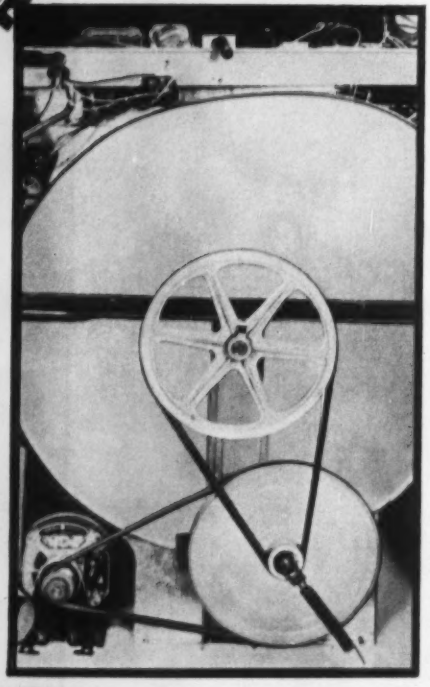

in the electronically-made

U. S. VIBRA-LESS V-Belt

The new U. S. VIBRA-LESS Belt brings new efficiency to washing machines, driers, belt-driven fans, air conditioners, machine tools, grinders and a host of other applications. *Electronic tension* and a *new molding method* are the reasons why.

Electronic Tension process builds the pulling cords into the belt by error-proof electronics, instead of by mechanical means. All cords are placed and spaced with scientific accuracy—to guarantee that each pulls its full share of the load, thereby prolonging belt life. Each cord is of equal tightness, for exact uniformity and greater reliability.

And along with Electronic Tension, "U. S." has introduced a *new method of molding* which produces a smooth surface with no high spots or imperfections. Consider what this means to high-precision machinery.

The new U. S. VIBRA-LESS Belt is so superbly accurate and uniform in construction that it runs with a smoothness and a silence never before encountered on a V-Belt drive. It reduces wear and tear on pulleys and bearings, prolonging belt life and drive life, and the equipment on which it is used. *Vibration is imperceptible,* thanks to the unfailing accuracy of these new developments.

U. S. VIBRA-LESS Belts are obtainable through any of the 27 "U. S." District Sales Offices or any of the selected "U. S." distributors.

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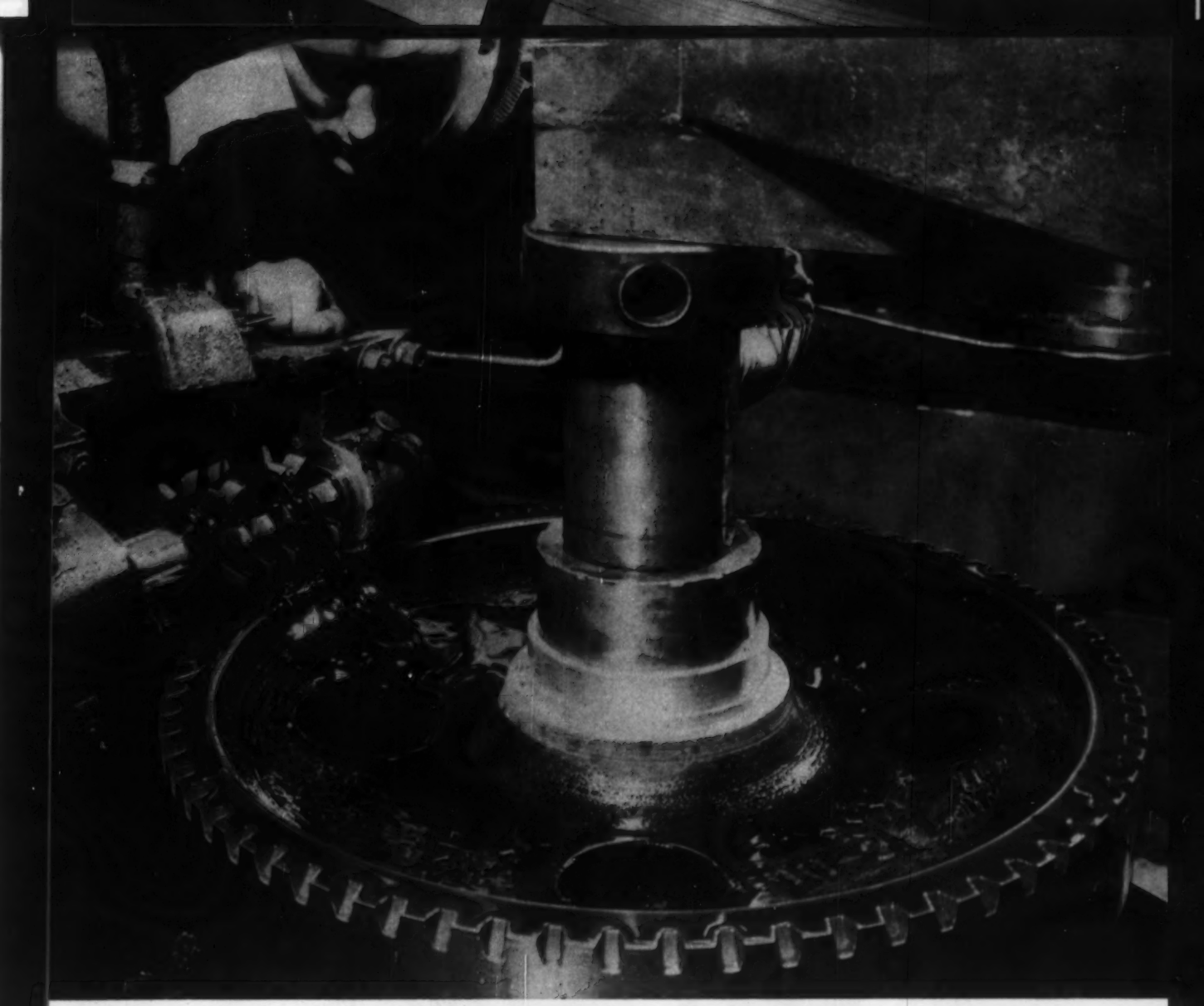

Pittsburgh Gear switched to SSW forged blanks... saved 50 minutes machining time, extended cutter life 20%

Switching to SSW forged steel gear blanks in manufacturing mine locomotive drive gears has given Pittsburgh Gear Company, Neville Island, Pa. . . .

- **savings of 50 minutes in machining time.**
- **better performance through extended service life (cutter life increased 20%).**
- **reduced cutter costs.**
- **over-all lower initial cost.**

These benefits are a result of the more uniform internal structure and close dimensional tolerances of Standard Steel blanks. Machining is done on a single setup, at a maximum speed because there's no danger of hard spots and sand porosity as with castings.

Pittsburgh Gear knows their product must take extra-rugged wear in mining operation. In service the continuous starting and stopping of mine locomotives subjects drive gears to severe shock and impact. The denser core and uniform structure of these SSW blanks contribute to longer-lasting, failure-proof life of these gears.

Like Pittsburgh Gear, you can improve your product and cut your costs with SSW forgings. Write today for the new Standard Steel folder on forged weldless rings and flanges. Use the coupon now.

Standard Steel Works Division

BALDWIN - LIMA - HAMILTON

Dept. 8546, Standard Steel Works Division
Baldwin-Lima-Hamilton Corporation, Burnham, Pa.

Please send me new Standard Steel Works folder containing detailed information on Forged Weldless Rings & Flanges.

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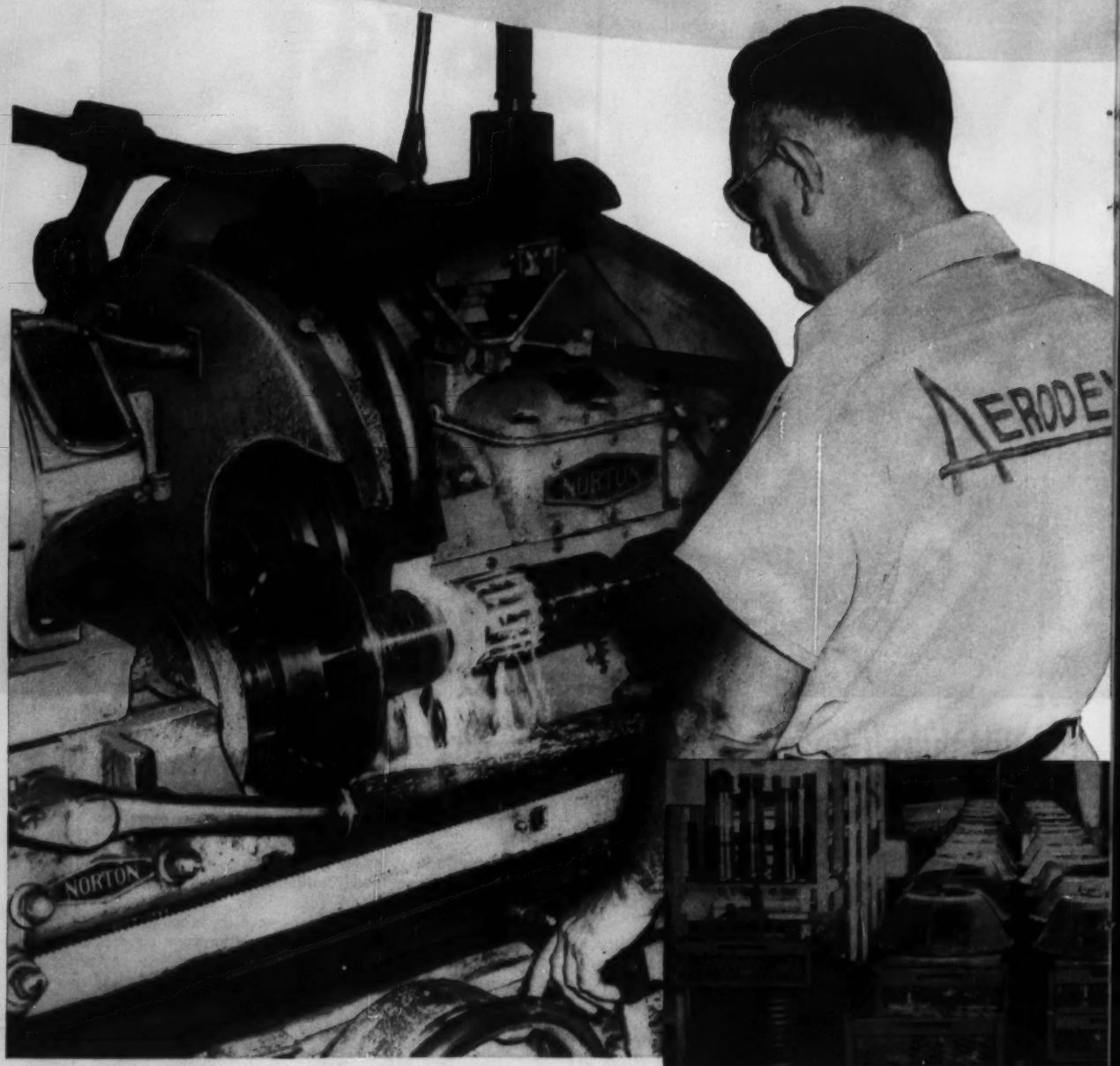
Company _____

Address _____

City _____ Zone _____ State _____

Gulf Products aid



Gulf Soluble Cutting Oil provides high cooling efficiency for this grinding operation on a propeller shaft.

A view of the material control area where the parts are stored in readiness for assembly after immersion in a tank of Gulf No-Rust FPR.

operations at Aerodex, Inc.

The world's most modern aircraft engine overhaul facility

By adapting mass production techniques to engine maintenance in the world's most modern engine overhaul shop at Miami, Fla., Aerodex, Inc. overhauls an engine with fewer man-hours than any other commercial organization. This represents a considerable saving to the Air Force, with whom Aerodex has large contracts, as well as to private concerns which send their engines in for overhaul.

Gulf products are used throughout the Aerodex shop to help speed their engine overhaul work. Gulf Lasupar Cutting Oil helps produce parts to extremely close tolerances with few tool changes in machining operations on many types of steel, while Gulf Soluble Cutting Oil provides high cooling efficiency for grinding operations. After machining, the parts are cleaned in a bath of Gulf Stoddard Solvent, then dipped in a tank of Gulf No-Rust FPR to protect polished metal surfaces against rust during temporary storage. Every engine is fueled and lubricated with Gulf Aviation Gasoline and Aviation Oil during the 3¾ hour test run after final assembly. And various other Gulf Quality Products help keep the auxiliary equipment required for a large operation of this type working smoothly and continuously.

You too will find, as did Aerodex, that there is a Gulf Product to fit your every need —quality oils and greases that can help you improve production and lower your maintenance costs.

Consult the telephone directory for the number of your nearest Gulf office, then contact a Gulf Sales Engineer for help on any problem that involves a petroleum product.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

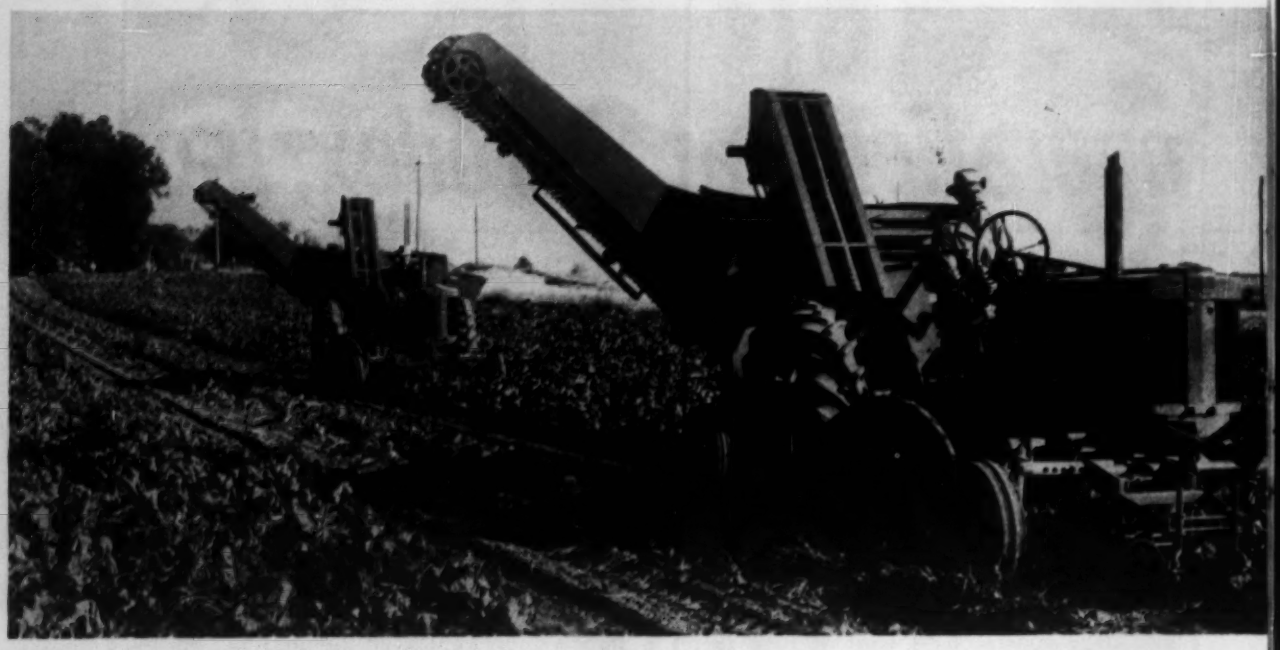
All engine parts are reworked, inspected and then sent to the material "hold" area, where they are immersed in Gulf No-Rust FPR. This quality rust preventive cleans the finely machined surfaces and protects them from rust during temporary storage.

GULF OIL CORPORATION

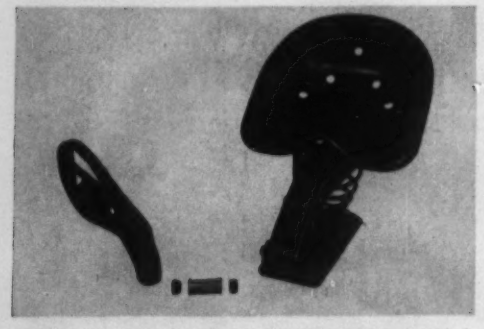
GULF REFINING COMPANY

1822 Gulf Building, Pittsburgh 30, Pa.

GULF

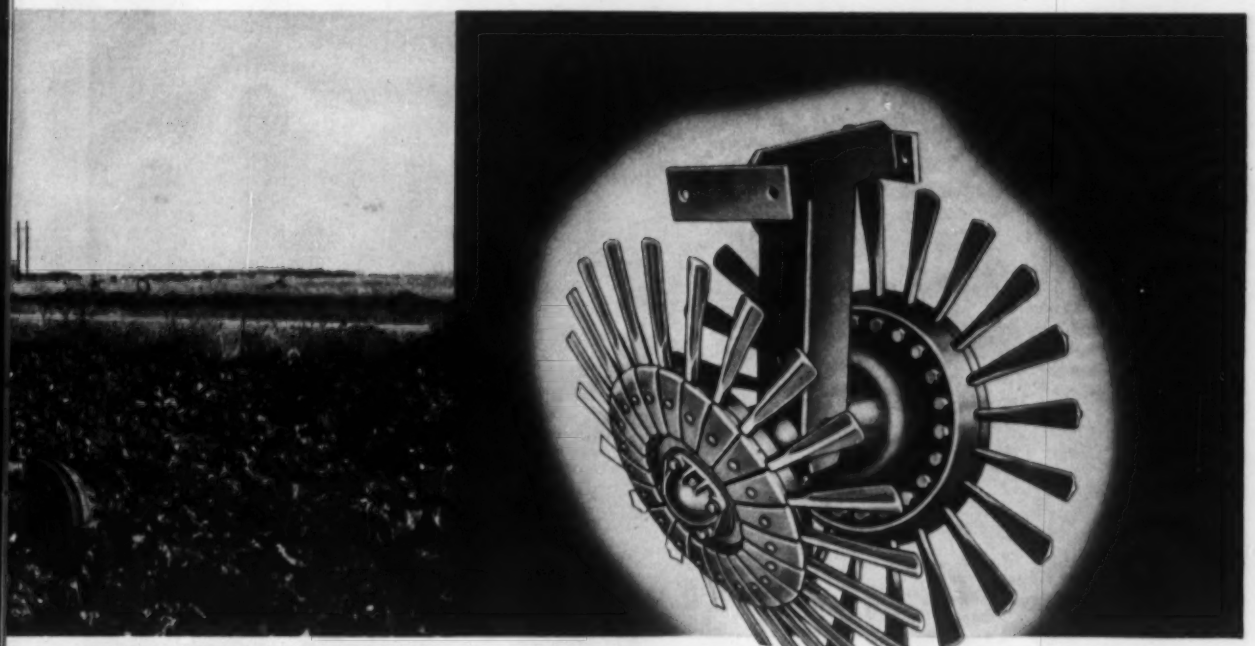


HOW ALLOY STEEL HELPS JOHN DEERE BUILD A STRONGER BEET HARVESTER



STRENGTH TO WITHSTAND SHOCK AND TWISTING is provided by Republic ELECTRUNITE Mechanical Tubing in this pilot tube which acts as a bearing for a tractor seat assembly. The tube is flared on each end and rubber grommets inserted. In this application, the tube must withstand constant shock and twisting caused by the uneven surface of furrows and plowed ground. ELECTRUNITE also provides uniform wall thickness, uniform concentricity, and is available with close I.D. and O.D. tolerances. Available in carbon and stainless analyses from Republic's Steel and Tubes Division.

HIGH STRENGTH and fine surface, toughness, hardenability, close tolerance, accuracy of section are cost-cutting qualities you can take full advantage of in steel parts production. Cold Drawn Alloy Bars supplied by Republic's Union Drawn Steel Division give you all six of these properties — plus UNIFORM MACHINABILITY. That's why so many manufacturers have come to Republic with their machining problems. Republic metallurgists and machining experts are always ready to help uncover the answers to tough cost and production problems. Write for information, there's no obligation.



Use of alloy steel permits tines on the John Deere No. 100 Beet Harvester to be made thin enough to penetrate hard ground, yet strong enough to withstand side pressure developed in squeezing the beets loose.

Field experience during the 1953 sugar beet harvest indicated that strengthening of the beet digger tines on the John Deere No. 100 Beet Harvester was necessary to prevent bending.

A change in the shape of the tine or tooth accomplished part of the strength increase. Deere's Engineering Department also felt that by increasing the surface hardness of the tooth, its performance would be improved.

But it was not possible to go to a higher hardness on the carbon steel previously used because the tines became so brittle that they would break under stress. So Deere switched to alloy steel, of which Republic is a supplier.

By taking full advantage of the superior strength and hardenability of alloy steel, bending and abrasion problems have been eliminated. The tines are 24% stronger than those previously made from carbon steel, and without loss in toughness or wearing qualities. Field experience in the 1954 harvest indicates that the alloy steel tine is completely satisfactory and has a much better service life than the previous types.

Alloy steels provide an outstanding combination of qualities essential to designing smaller sections to carry heavier loads with no sacrifice of strength or safety. They resist fatigue, shock and stress. They respond uniformly to heat treatment, producing hard, wear-resistant surfaces around tough cores.

Perhaps you have a problem involving one or more of these factors. Republic—world's largest producer of alloy steels—offers you metallurgical and engineering assistance to help you get the most from alloy steels at the lowest possible cost. Mail the coupon for complete information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

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Cleveland 27, Ohio

REPUBLIC STEEL

Please send me information on:

- ☐ Alloy Steels
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- ☐ Cold Finished Steels

Name_____ Title_____

Company_____

Address_____

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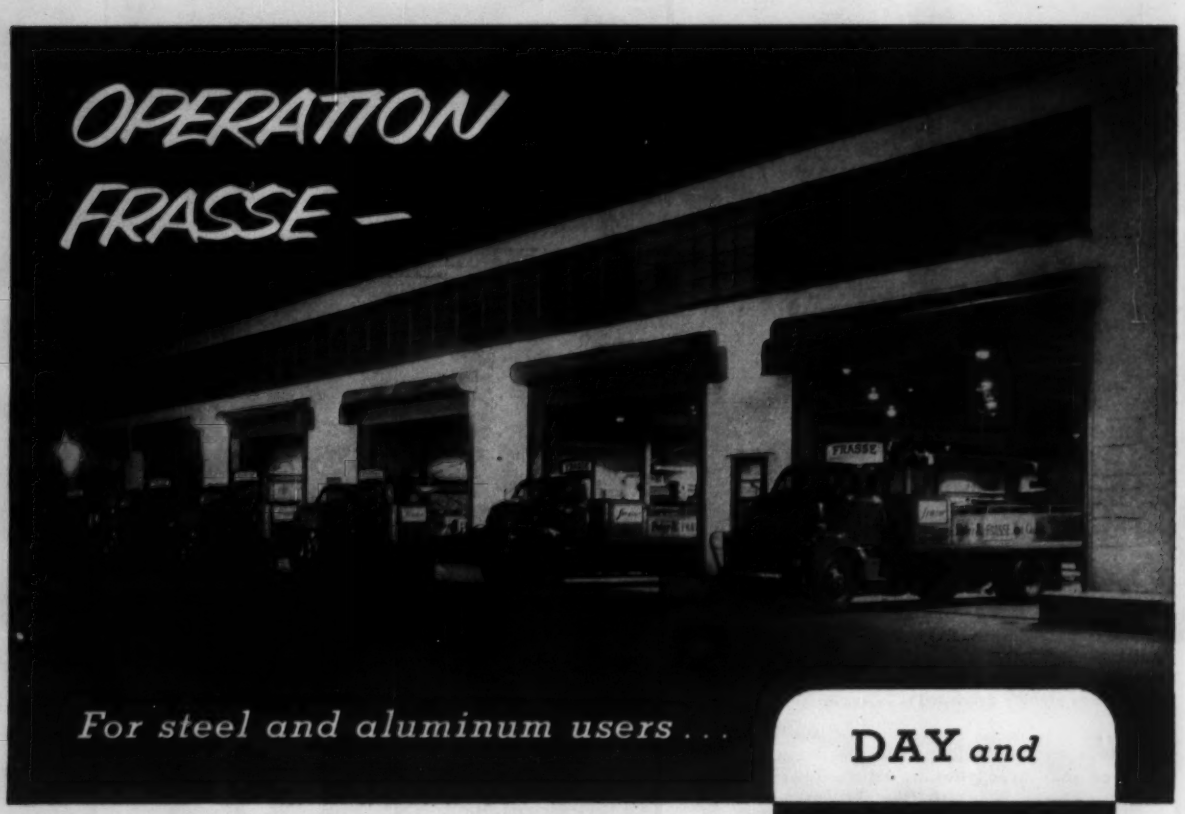
K-4017



DAY *and*

NIGHT

While you sleep, loading operations are underway . . . before you awaken modern Frasse trucks are rolling with material you ordered hours ago.

This fast, on-the-ball delivery is typical of the handling your orders receive when you do business with Frasse. Thousands of firms know this service is *routine* . . . and depend on quick, sure delivery from Frasse to keep production lines producing.

Frasse stocks *all* of the popular grades, shapes and sizes of stainless, alloy and carbon steels, tubing and aluminum . . . plus many specials, too. When you work from complete Frasse warehouse stocks you eliminate needless "shopping".

And, remember — Frasse engineers are always available to consult with you on problems involving steels, tubing and aluminum. Their services are free, and they can be consulted anytime — by mail, phone . . . or on the spot in your plant.

It's

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for complete warehouse service

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LYNDHURST ROCHESTER BALTIMORE

CALENDAR
OF MEETINGS

Oct. 31-Nov. 1, Magnesium Association: Annual meeting, Biltmore hotel, New York. Association's address: 122 E. 42nd St., New York 17, N. Y. Secretary: Jerry Singleton.

Oct. 31-Nov. 2, Society of Automotive Engineers Inc.: Transportation meeting, Chase hotel, St. Louis. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Oct. 31-Nov. 2, Wire Reinforcement Institute: Annual fall meeting, Ambassador hotel, Chicago. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

Nov. 1-3, Grinding Wheel Institute and Abrasive Grain Association: Fall meeting, Hotel Statler, Buffalo. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15, O.

Nov. 1-3, Investment Casting Institute: Annual meeting, Sheraton-Cadillac hotel, Detroit. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: Harry P. Dolan.

Nov. 2-4, National Fluid Power Association: Fall meeting, Edgewater Beach hotel, Chicago. Association's address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

Nov. 2-4, Society of Automotive Engineers Inc.: Diesel engine meeting, Chase hotel, St. Louis. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Nov. 3-4, Society for Advancement of Management: Measurement of management conference, Hotel Statler, New York. Society's address: 74 Fifth Ave., New York 11, N. Y. Conference director: Hugh C. Wyland.

Nov. 3-6 National Tool & Die Manufacturers Association: Annual meeting, Hotel Statler, Detroit. Association's address: 907 Public Square Bldg., Cleveland, O. Executive secretary: George S. Eaton.

Nov. 4-7, National Screw Machine Products Association: Fall membership meeting, Boca Raton hotel and club, Boca Raton, Fla. Association's address: 2860 E. 130th St., Cleveland 20, O. Executive secretary: Orrin B. Werntz.

Nov. 7-9, American Society for Personnel Administration: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Society's address: P. O. Box 1413, Milwaukee, Wis. Secretary: Russell L. Moberly.

Nov. 9-10, Council of Profit Sharing Industries: Annual conference, Huntington-Sheraton hotel, Pasadena, Calif. Council's address: 327 W. Madison St., Chicago 6, Ill. Executive secretary: Joseph B. Meier.

Nov. 9-10, Society of Automotive Engineers Inc.: Fuels and lubricants meeting, Bellevue-Stratford hotel, Philadelphia. Society's address: 29 W. 39th St. New York 18, N. Y. Secretary: John A. C. Warner.

Nov. 9-11, Industrial Management Society: Annual time and motion study and management clinic, Sherman hotel, Chicago. Society's address: 35 E. Wacker Dr., Chicago 1, Ill.

Nov. 9-12, National Association of Aluminum Distributors: Annual meeting, Arizona-Biltmore hotel, Phoenix, Ariz. Association's address: 1900 Arch St., Philadelphia 3, Pa. Secretary: R. Bruce Wall.

Nov. 10-11, American Zinc Institute Inc.: Fall meeting, Galvanizers committee, Drake hotel, Chicago. Institute's address: 60 E. 42nd St., New York 17, N. Y. Secretary-treasurer: E. V. Gent.

Nov. 13-18, American Society of Mechanical Engineers: Annual meeting, Congress, Hilton and Blackstone hotels, Chicago. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

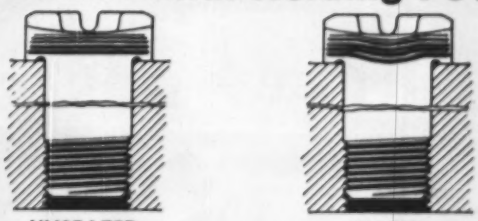
Nov. 14-16, National Metal Trades Association: Annual convention, Commodore hotel, New York. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

Nov. 14-17, International Automation Exposition: Navy Pier, Chicago. Information: Richard Rimbach Associates Inc., 845 Ridge Ave., Pittsburgh 12, Pa.

Now! Safer-Surer Vibration Point Assembly with slotted-type "Place" Bolts by WESTERN

Now you can prevent involuntary loosening caused by vibration, impact or shock, with this unique one-piece, self-locking fastener. *Spring action* head locks bolt securely when tightened against a rigid seat, assuring vibration-proof, shock-proof holding power. Greater elastic elongation in both head and shank drastically reduces fatigue failure. These economical, re-usable bolts, made of either cold forged carbon or alloy steel, are made to order in a wide range of sizes in both Coarse and Fine series threads. Write today for folder and prices.

Maintains Initial Holding Power



UNSEATED SEATED

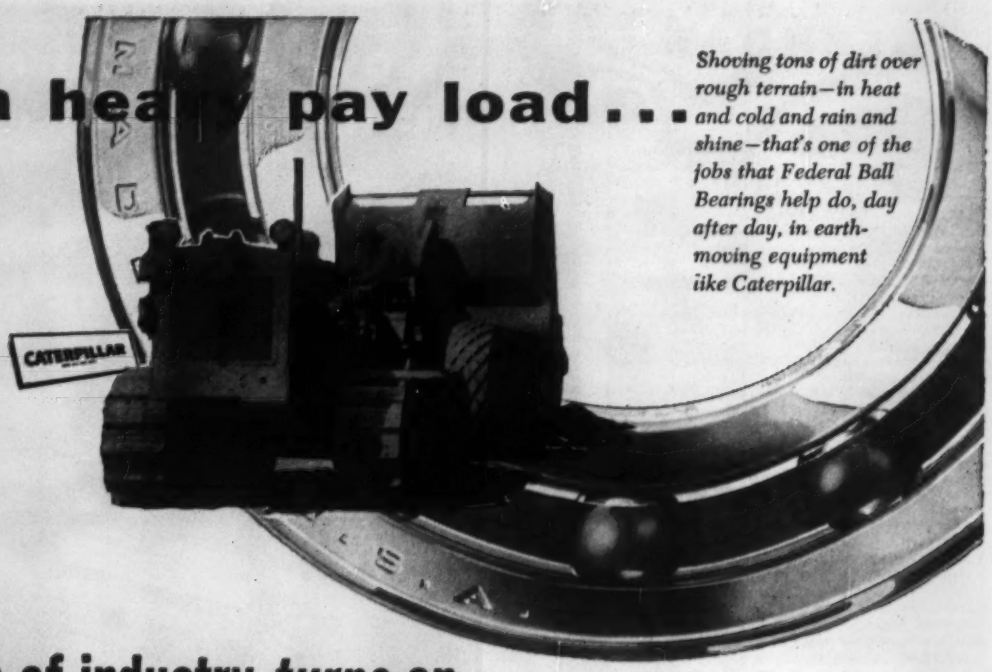
Controlled spring action in the slotted-type "PLACE" BOLT head when tightened against a rigid seat augments the elastic elongation of the bolt shank in safeguarding against the loss of initial bolt tension.

Licensed under U.S. Patent No. 2543705

Western Automatic Machine Screw Company
377 Woodland Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873

for a heavy pay load . . .



Shoving tons of dirt over rough terrain—in heat and cold and rain and shine—that's one of the jobs that Federal Ball Bearings help do, day after day, in earth-moving equipment like Caterpillar.

so much of industry *turns* on FEDERAL ball bearings

Out in the open—or in on a desk—out on the road or up in a plane—the chances are you'd find Federal Ball Bearings quietly and efficiently at work—in some of the hundreds of types and 12,000 sizes this 50-year-old company is currently producing. When Federal Ball Bearings are a part of so many things you *use*, why shouldn't they be a part of the things you *make?*

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175 fact-packed pages of information on ball bearings are yours for the asking in Federal's Catalog. Just drop us a line for your copy.

on a heavy pay roll . . .

Business counts on business machines to keep working smoothly with little or no attention—one reason why so many business machine makers like IBM count on Federal Ball Bearings.

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BALL BEARINGS
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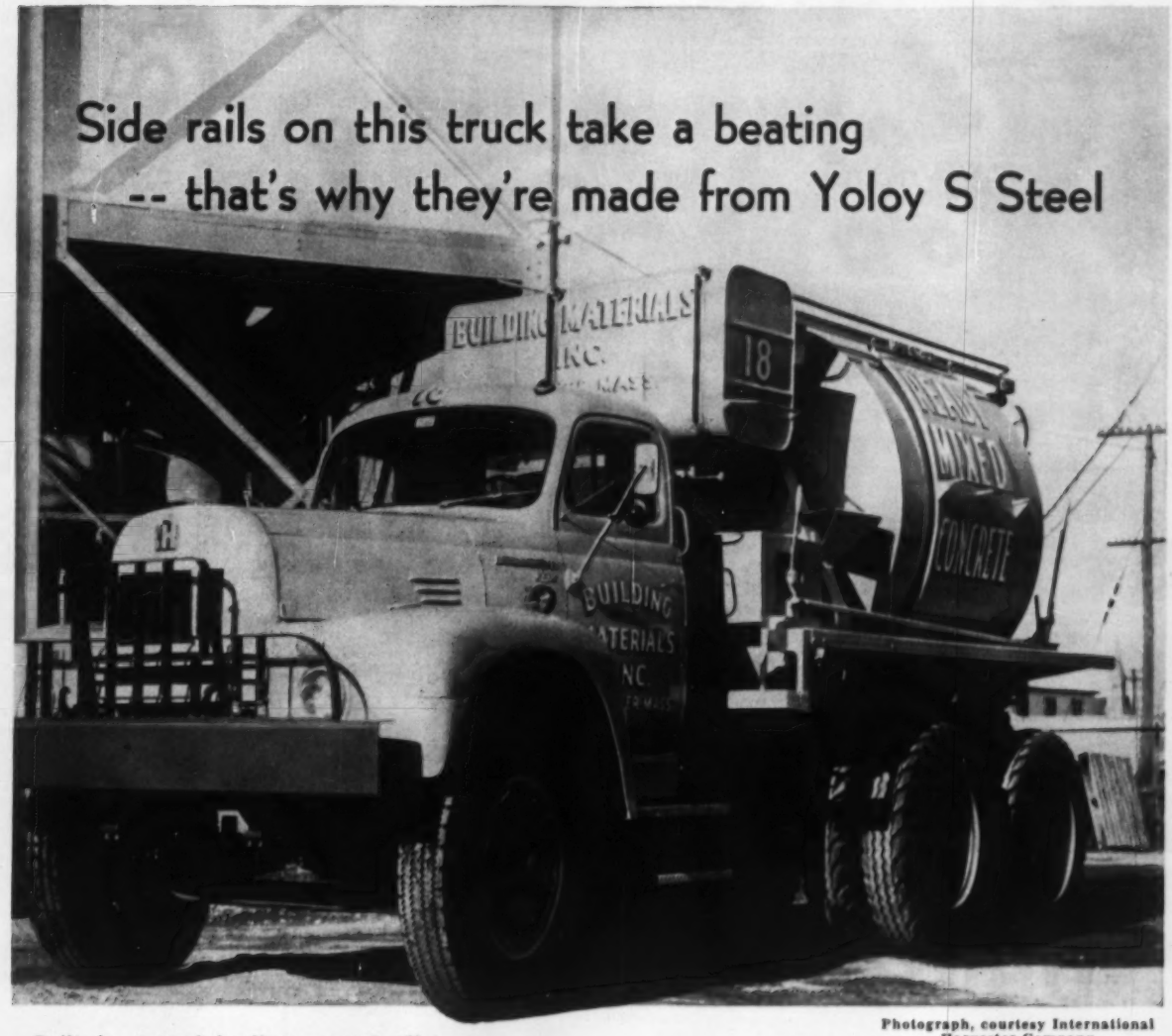
Side rails on this truck take a beating
-- that's why they're made from Yoloy S Steel
BUILDING MATERIALS INC.
18
READY MIXED CONCRETE
BUILDING MATERIALS INC.

Photograph, courtesy International Harvester Company

Built for rugged hauling, on and off highways, this mixer truck has to have side rails that can take it—that's why they are made from Yoloy S Steel.* Yoloy S because its' a higher strength steel, 65,000 lbs. per sq. in. minimum yield strength, especially made where higher strength to weight ratios from normal construction is required for additional stamina. It has higher resistance to corrosion, abrasion, shock and vibration. The higher strength of Yoloy S permits valuable reduction in dead weight.

International Harvester, whose Model RF-230 is shown above, is just one of many prominent manufacturers who include Yoloy steels in their building specifications. If you have a problem, we would like to help you. Our District Sales Office near you is ready to supply information and service on the specific steels in the Yoloy Family that best meet your needs.

*Yoloy S frames fabricated by The Youngstown Steel Car Co., Niles, Ohio.

QUALITY YOUNGSTOWN SERVICE

Youngstown

Yoloy S (Nickel-Copper) Higher Strength Steel
Yoloy E (Nickel-Chrome-Copper) High Strength Low Alloy Steel

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

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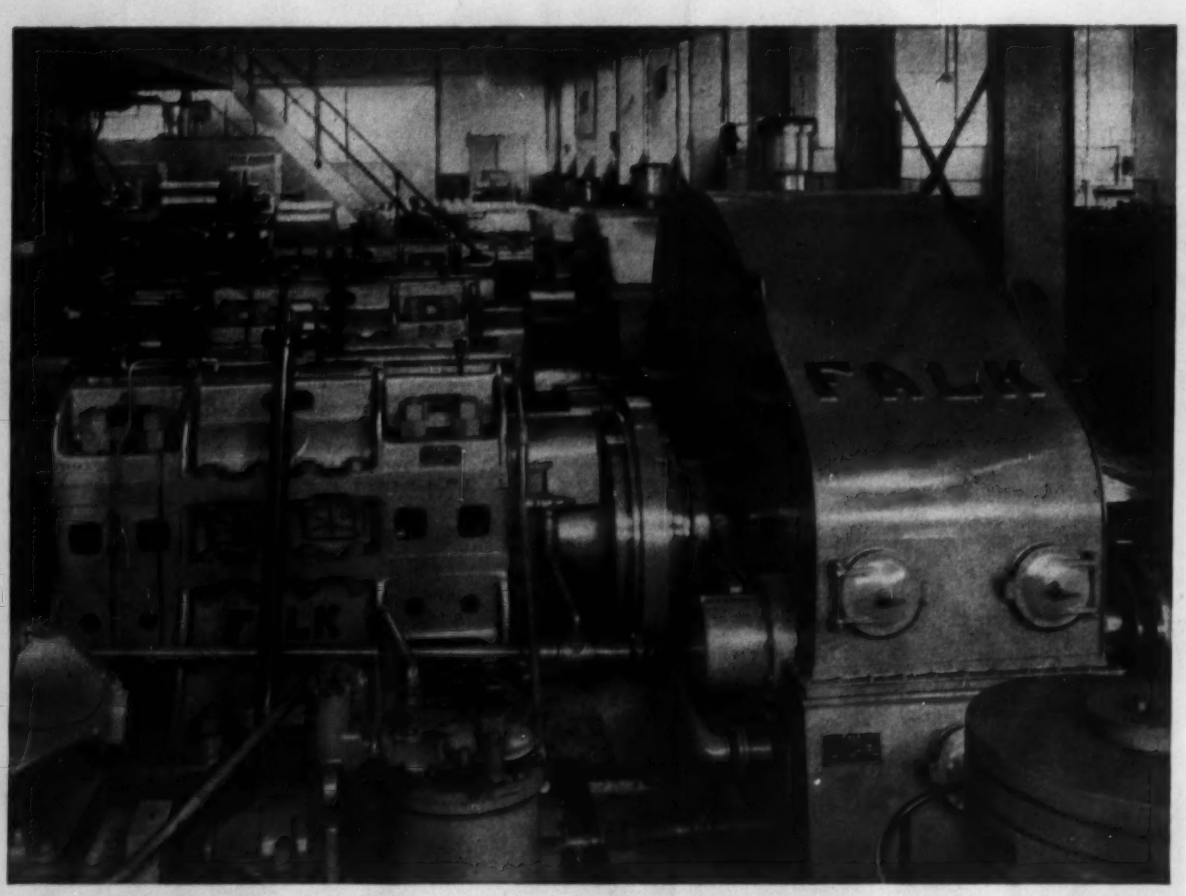


"Inside Story" of Better Gear Protection—

EXTREME pressures generated in enclosed reduction gear drives and pinion stands call for a lubricant with high EP characteristics — *Texaco Meropa Lubricant.* The EP properties of this fine oil stand up through the severest service, assure smoother, quieter operation, full protection and longer life for gears and bearings... lower maintenance costs.

Texaco Meropa Lubricant is especially resistant to oxidation and thickening. It does not foam... does not separate in service, storage or centrifuging... protects bearings from corrosion.

A Texaco Lubrication Engineer will gladly give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . TEXACO STAR THEATER starring JIMMY DURANTE on television . . . Saturday nights, NBC.

Metalworking Outlook

Labor Prospects

Things to look for in 1956 labor demands: The full union shop (the Big Three auto firms granted it this year); Supplemental Unemployment Pay, especially in steel (for the CIO-UAW, this will be a clean-up operation); large wage increases (the national average this year runs 10-12 cents); longer fringes (the steel industry estimates that extras already cost it 50 cents per hour per worker, or 17.5 per cent of total labor costs).

How Much for SUP?

Is a company contribution to a SUP fund too large when it's 5 cents per hour per worker? A Baltimore firm, which had substantial layoffs in 1946, 1949 and 1954, figured what SUP would have cost it had the plan been in effect for the last decade. The conclusion: 3½-cents per hour per worker. Ford officials admit privately that their 5-cent sum is probably high.

McDonald Wins

Early returns last week indicated that United Steelworker President David J. McDonald won a vote of confidence. In contests for two union offices, McDonald-supported candidates were winning over insurgents. Howard R. Hague had a commanding lead over Joseph P. Molony for international vice president, and B. W. Ohler defeated Nick Radlick as director for District 28 in northern Ohio. Both Messrs. Hague and Ohler had been appointed earlier to those posts by Mr. McDonald, following the deaths of their predecessors.

Sound, Fury on Automation

Don't expect any legislative proposals to come out of the automation hearings held by the Joint Committee on the Economic Report. At the beginning only one Congressional committee member showed up—Rep. Wright Patman (Dem., Tex.). After thousands of words of testimony, the consensus: Automation may displace employment on a temporary basis, but in the long run it's good for the economy and in the American tradition of technological development. Walter Reuther takes exception to that position, but even he admits that automation hasn't caused any serious unemployment, "but it might in a static economy."

Heat's on Gas Appliances

Gas equipment sales are at a $600-million annual rate, a near-record. Shipments of gas water heaters and furnaces are probably at all-time highs. Willard F. Rockwell Jr., president of Rockwell Mfg. Co. and the Gas Appliance Manufacturers' Association, says only Vermont will not be receiving natural gas service by the end of 1956. Natural or manufactured gas is used in some 26 million homes and by more than 2.2 million indus-

Technical Outlook—p. 65 Market Outlook—p. 87

trial and commercial firms and institutions. The industry operates a 469,000-mile network of pipelines.

Orders Rising

The index of orders placed by industrial distributors (also called mill supply houses) is at a peacetime high. Because these distributors deal with such a broad segment of metalworking, their activity reflects general industrial volume. The index jumped from 181.2 for August to 203.2 for September. In only four months of the Korean War, January to April, 1951, has the index previously crossed the 200 mark.

Investment in Research

Research and development is contributing a minimum of some $40 billion a year to our gross national product. Dr. Raymond Ewell of the National Science Foundation says: "If one assumes that all research had come to a halt from 1928 to 1953, the cumulative loss in gross national product would have been $400 billion." The annual cost of research and development in the U.S. during the same period was about $30 billion, indicating a return on the research investment of 13 to 1.

British Auto Output Up

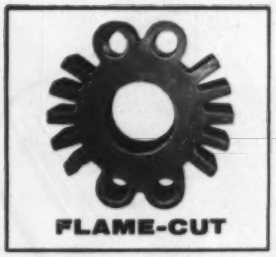
The U.S. isn't the only country producing a record number of autos this year. Great Britain expects to turn out 1,250,000 cars and trucks in 1955, 18 per cent more than in 1954. By 1960 production should reach 1.5 million, with about half going into the export market.

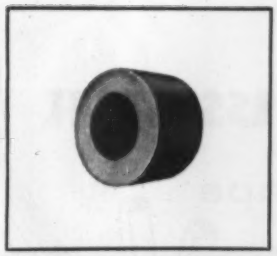
Silver Lining?

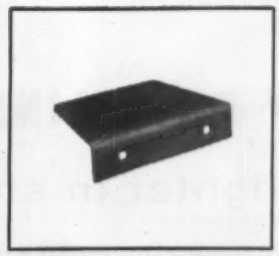
Despite a two-week shutdown because of labor problems at Kaiser Steel Corp.'s Fontana, Calif., plant, smog in the area reached record proportions. Kaiser has borne the brunt of the blame for smog around Fontana. With the plant idle but smog even heavier, officials hope the politicians will turn their wrath elsewhere.

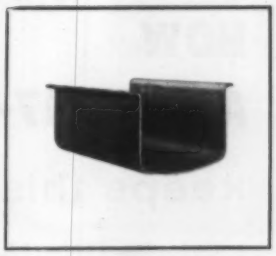
Straws in the Wind

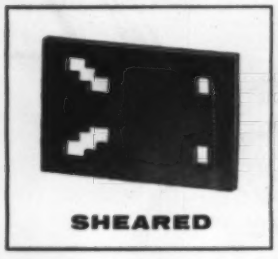
Auto dealers' new car stocks dropped to 370,000 as of Oct. 10, the lowest point this year . . . Housewives will handle 3500 tons of steel wire this year in drying clothes, the approximate tonnage used to make 6 million gross of wire clothespins . . . General Dynamics Corp.'s Convair Division has placed a $650,000 order for titanium bolts with Standard Pressed Steel Co. . . . British Aluminium Co. Ltd. will build a 160,000-ton-a-year smelter at Baie Comeau, northeast of Quebec City on the St. Lawrence . . . National Research Corp. has acquired exclusive U.S. licensing rights for the Bochumer Verein steel degassing process . . . Tappan Stove Co. is introducing an electronic cooking range . . . As of Sept. 30, U.S. Steel Corp. had authorized spending $547 million for additions and replacements, up $80 million from three months earlier.



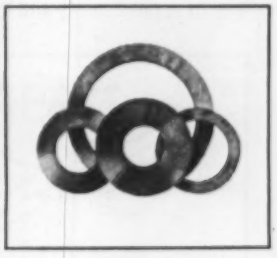


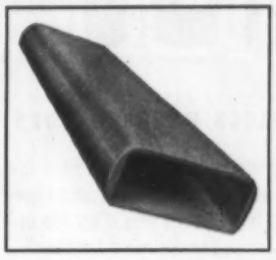


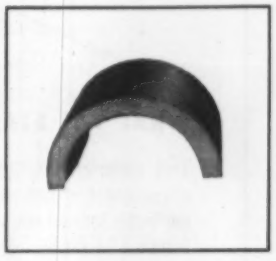


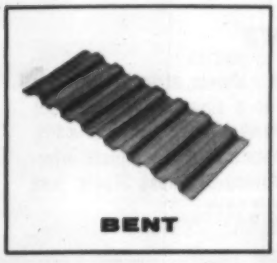


HOW MUCH WOULD YOU SAVE WITH PRE-FORMED PARTS?









STEEL PLATE SHAPES SERVICE CAN HELP CUT COMPONENT COSTS 5% TO 25%

You can slash production costs 5% to 25% . . . and get greater versatility and design freedom . . . with parts pre-formed from rolled carbon, alloy or clad steel plate.

Using By-Products Steel Co.'s Steel Plate Shapes Service, you get close tolerances that permit quick and easy incorporation into assemblies, often without further finishing. Men and machines can be freed for other work, and reduced fit-up time and the elimination of production steps speeds operations.

Reduced freight and handling charges and less need for costly plate inventories are additional benefits of this service. Over 150 major machines and an extensive standard die stock are available. Work can be done directly from blueprints in the finish you specify: as formed, rough- or finish-machined.

Your parts can be formed from plates up to 195" wide or 25" thick. Our location adjacent to the facilities of the world's leading producer of specialty steel plate assures flexibility in forming and heat treating to your specifications. For additional information on how you can put this Service to work, write on your letterhead for Bulletin 712. Address: By-Products Steel Co., 742 Strode Avenue, Coatesville, Pennsylvania.

LUKENS

STEEL PLATE SHAPES SERVICE

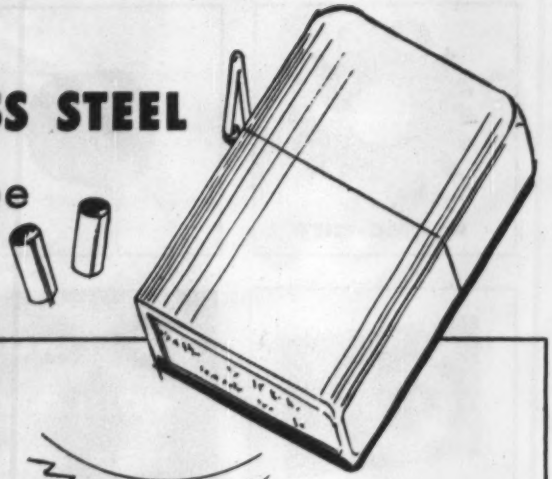
BY-PRODUCTS STEEL CO.

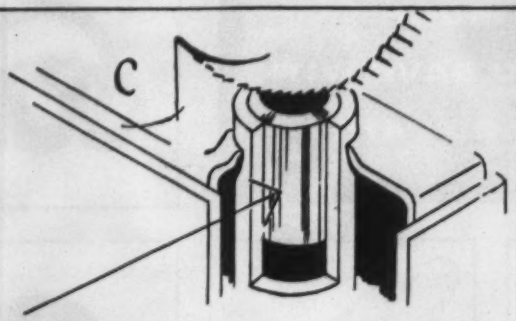
A Division of Lukens Steel Company, Coatesville, Pennsylvania

HOW ARMCO 17-7 PH STAINLESS STEEL

keeps this lighter in shape

A tiny hardened Armco 17-7 PH Stainless Steel bushing is the key to dependability and long service life of a well-known lighter.





WHAT THE STAINLESS BUSHING DOES

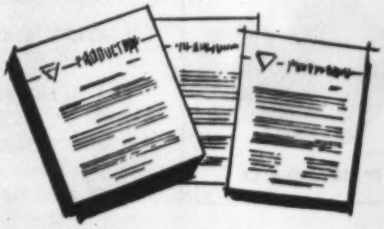
This collar in the top of the tube keeps the flint in alignment and prevents jamming. The collar must be perfectly formed and very hard. That's why it's made of Armco 17-7 PH Stainless Steel, precipitation hardened.

NO "FLOPOVER" FLINTS

In an ordinary flint tube, repeated pressure of the spark wheel against the flint causes the end of the tube to expand. This permits the flint to "flop over," making the lighter useless.

WHAT THIS STEEL OFFERS YOU

Consider the advantages of Armco 17-7 PH Stainless Steel for your products. It can be drawn and formed in the annealed condition to close tolerances. Then, it can be hardened at low temperatures to tensile strengths of around 200,000 psi. It is "transformed" by holding at 1400 F for 1½ hours and cooling to 60 F or below. Hardening is completed by heating to 950-1050 F, holding for ½ to 1½ hours and cooling.



GET COMPLETE DATA

Armco 17-7 PH is produced in sheets, strip, plates, bars and wire. Besides, there is a single heat treatment precipitation-hardening stainless steel, Armco 17-4 PH, made in bars, wire and billets only. For complete information on these special Armco Stainless Steels, just fill out the coupon and mail it to us.

ARMCO

ARMCO STEEL CORPORATION
1585 CURTIS STREET, MIDDLETOWN, OHIO

SPECIAL STEELS

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Building Engineers

Even though there is a slight uptrend in the number of engineering graduates, there is no foreseeable balance of supply with demand.

Each year there are jobs for 35,000 to 45,000 engineers.

The 22,000 graduates of technical schools and colleges this year were offered a selection of jobs in a variety of industries months before diploma time.

The 29,000 who will graduate next year already are being approached by prospective employers.

Engineers out of school and in industry are barraged by invitingly written advertisements in newspapers and other publications, promising greener pastures.

But the shortage persists, and predictions are that it will get worse.

The roots of the problem start at the primary and secondary school levels and extend to the technical colleges and industry itself.

Only one out of eight boys and girls entering grade school finishes college.

Nowhere along the line are the 30 million students of precollege age adequately informed about the advantages of higher education—let alone inspired to get one.

Science departments in secondary schools and colleges are often understaffed. Good instructors drift away to more lucrative jobs.

In industry, engineers often face a lack of appreciation, a lack of recognition of their importance and have too little opportunity for advancement.

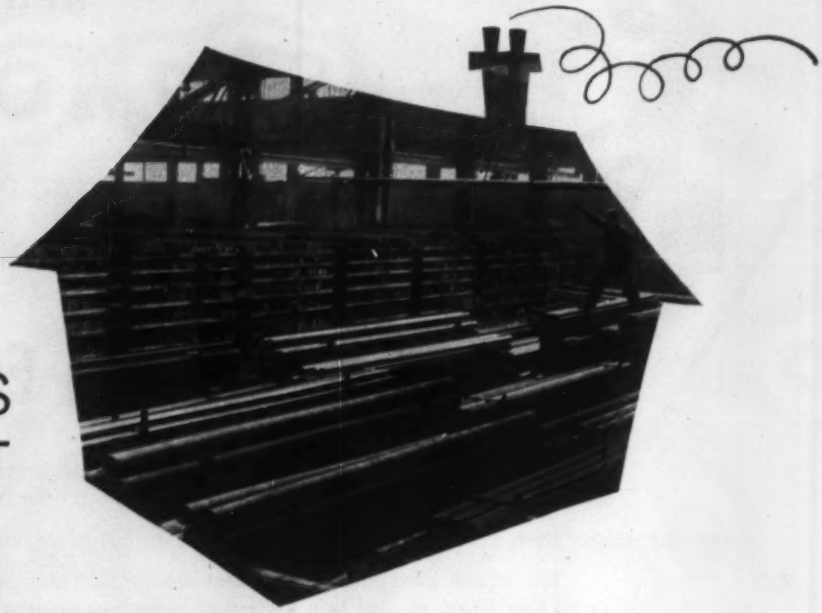
Solution is up to industry. It must stimulate and aid talented youngsters, help them start and complete their education in engineering. It must point out that a technical education for the ambitious can lead to important positions in research, product development, production, sales and administration.

At the job level, industry must make sure that income, incentives and opportunities for advancement develop and hold good men.

Industry must assume these new responsibilities if it hopes to build up and maintain an adequate supply of engineering talent.

Irwin H. Such

EDITOR



A NEWS REPORT

...from the home of FASTEST machining steels

Leaded plates—Now lead has been added to E-Z-Cut plate. As a result, E-Z-Cut, which was already considered one of the best free-machining plates on the market, is better than ever. Tests show that New E-Z-Cut cuts even faster, polishes to a better finish than non-leaded E-Z-Cut. And because sulphur content is much lower, is much cleaner steel. First stocks include thickness up through 3".

Did you know that the largest stocks of Ledloy—world's fastest machining steel, await your call at Ryerson? Our stocks are largest from both a tonnage and size range standpoint. And stocks of other C.F. bars are also in excellent shape.

New sizes of leaded alloys—Increasing demand for New Rycut 50, fastest machining .50 carbon alloy steel has prompted Ryerson to increase the range of sizes in stock. Hot rolled rounds, both annealed and heat treated, are now available in large sizes—up through 9½". So shafting, gears, cams, etc. can be produced at savings possible only with Rycut alloys.

"Increased production 200% using new Rycut leaded alloy"—"cut unit costs 32% using Ryerson Ledloy"—"reduced machining time 35% with New E-Z-Cut plates." Hundreds of reports like these testify to the savings realized with Ryerson faster cutting steels in shops from coast to coast. And Ryerson engineers will be glad to help you apply these steels to your operations.

You can be sure of getting the latest and best of proved fast-machining steels at Ryerson because, serving the widest market with the largest, most diversified stocks, we are in close touch with every new development.

So if you want to save on the final cost of a machined part—whether carbon, alloy or stainless steel—call the home of fast-machining steels—call Ryerson.

REDUCE COSTS WITH:

Rycut Leaded Alloys	**New E-Z-Cut Plates**
Free-Cutting Stainless	**Ledloy Bars**
Medium Carbon Rytense A. A.	**Case Hardening Rycase**

OTHER STEELS IN STOCK: Structurals, Tubing, Safety Plate, Sheets and Strip, Reinforcing, Tool Steels, Carbon Steel, Alloys and Stainless. Also Metal Working Machinery and Tools.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

A Peek at Next Year

Profits . . . About the same
Prices . . . Higher, 2 to 3 per cent
GNP . . . $400 billion
FRB (avg) . . . 141
Best Quarter . . . Second
Personal Income . . . $313 billion
Consumer Debt . . . will keep growing
New Plant and Equipment . . . Up, to $30 billion
Steel Ingots . . . 115 million tons
Construction, Total . . . $43 billion
Housing Starts . . . 1.2 million
Passenger Cars . . . 7 million plus
Trucks . . . 1.25 million
Appliances . . . Up maybe 10 per cent
Machinery . . . Higher
Electrical Machinery . . . About the same
Farm Equipment . . . Maybe small pickup
Containers . . . More gains
Railroads . . . Should be better
Aircraft . . . Holds its own
Shipbuilding . . . Small improvement
Oil and Gas Equipment . . . Increase
Employment . . . New highs

Excellent first-half prospects keep confidence high as . . .

A Record 1956 Shapes Up

HERE'S WHAT you can expect in business next year:

In a roaring first half, most lines will "never have had it so good," though a few may have to sit by and watch their luckier cousins reap the harvest. In the second half, a dip—not enough to hurt much, just a reminder that what goes up can come down.

But any dip will be moderated by the usual fall upturn arriving on schedule. We'll have a situation different from that in late 1953 when the upturn didn't show up till about a year later. This time there won't be such widespread, top-heavy inventories to be worked off.

Roadblocks — Acting against that: Tight supplies in many lines. Some easing up will come, but it won't be enough to allow big stock build-ups. Also, many firms learned the hard way in 1953-54, will keep a sharp eye on inventories to prevent overloading.

More critical is that intangible thing called confidence. Opinion is that sometime toward the end of the second quarter businessmen will pause to catch their breath, take a look around. What they see then will determine whether business will keep plowing ahead at forced draft or will slow down. The political picture could be a factor.

Squeeze—Profits probably won't quite keep pace with higher business activity. But they'll be as good as 1955's. Inability to pass on higher costs may pinch some firms.

But favorable signs are these: Consumer confidence is likely to stay high as long as businessmen's does. If jobs are plentiful (and indications are that they will be), Mr. U. S. Citizen will continue plunking out his dollars almost as fast as they come in, if not a little faster. His buying power is at an all-time high, and he's taking advantage of it.

Taxes—A candidate to soup up consumer spending still more is an almost certain cut in personal income taxes. That will mean about $2 billion more the consumer can spend.

Tax cuts for business are unlikely, big ones anyway. Vote getting will be one of the big reasons for any personal tax reduction. And, as has often been pointed out: "Corporations can't vote."

Ally — Nevertheless, politics in one way at least will work on the side of business. Neither party can afford to let business drop off sharply just before elections.

With a Republican Administration and Democratic Congress, each would blame the other. So pump-priming measures will be readied at the first sign of a sharp slide in business.

Spotlights—One of the first actions would be easier credit for home buying. As it is, Federal Reserve officials are keeping a tight watch on the housing market in case present tighter credit stifles building.

One of the few dark clouds in the picture is the possibility of a strike when the Steelworkers hit the industry with Supplemental Unemployment Pay demands. Majority opinion is that a walkout, if any, would be short, like this year's.

One more: If businessmen don't

like the looks of the economic or political climate, they could cut back on capital spending—not so likely in the case of the big companies, but possible in medium and small ones; they can't afford to sit on new facilities and wait for the weather to improve.

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Steel Hits Quarterly High

	Third Quarter Net Earnings		Third Quarter Sales	
	1955	1954	1955	1954
Alan Wood Steel Co.	$ 714,272	$ 143,557	$ 15,512,283	$ 7,328,006
Allegheny Ludlum Steel Corp.	4,015,512	546,886	64,983,067	38,603,712
Barium Steel Corp.	972,487	81,314	18,748,468	14,401,445
Colorado Fuel & Iron Corp.	7,732,241	2,179,896	.....	.....
Continental Steel Corp.	676,489	370,022	10,713,977	8,394,778
Crucible Steel Co. of America	2,752,293	380,632	57,051,575	33,834,011
Detroit Steel Corp.	1,381,058	190,938(L)	24,856,391	11,930,750
Granite City Steel Co.	3,545,513	1,061,114	30,196,316	16,132,536
Inland Steel Co.	13,017,963	6,875,977	166,401,313	125,221,435
Jones & Laughlin Steel Corp.	12,267,000	4,387,000	182,390,000	108,702,000
Pittsburgh Steel Co.	2,145,983	481,437	64,983,067	38,603,712
Republic Steel Corp.	22,005,740	10,302,001	301,952,235	195,616,821
Rotary Electric Steel Co.	960,227	13,539	13,207,780	5,446,215
Sharon Steel Corp.	1,776,903	501,578	42,129,015	20,830,715
U. S. Steel Corp.	89,628,983	44,323,860	1,035,804,426	769,623,110
Wheeling Steel Corp.	4,206,000	1,912,920	64,264,000	46,600,266
Youngstown Sheet & Tube Co.	11,240,677	4,474,003	156,624,751	102,482,025

(L) Loss

THIRD QUARTER income for steel companies is higher than ever, according to earning statements of leading steel producers.

Steelmakers are operating at or near full capacity to meet the increasing demand brought on by a booming gross national product which hit a record annual rate of $392 billion for the third quarter of this year.

Sales have doubled over a like period in 1954, and net incomes are reflected in higher bookings which have been consistent all year. Most companies report they are booked solid for the fourth quarter, and some aren't accepting orders before the second quarter of 1956.

Inventory Bulwark — Republic Steel Corp.'s president, Charles M. White, says: "Another bulwark for future business is the inventory situation.

"Traditionally, steel users try to build inventory when steel operating rates exceed 90 per cent. The industry has been running above 90 per cent for some months, yet the amount of inventory which has been built during those months has not been large enough to make any significant difference in the overall picture."

Amortization Runs Out — One reason for higher income this quarter among some companies is that their five-year tax write-off credits have expired. As amortization credits decline, net taxable income rises proportionately.

Outlook—The unexpected rise in automobile production has helped the demand for steel. There are more requests for steel from the construction industry, and railroads have re-entered the market.

As steelmakers face the last quarter, it looks like 1955 will be a banner year for the industry.

J & L To Expand Plants

Jones & Laughlin Steel Corp. will expand its ingot capacity 11 per cent.

It will add 400,000 net tons at Cleveland and 300,000 tons at Aliquippa, Pa.

The Cleveland expansion will be achieved through improvement of open hearths and the installation of two electric furnaces. J&L now has no electrics.

The Aliquippa expansion will be made through installation of two oxygen converters.

Electric furnaces are to be added at Cleveland to make use of that area's large supply of scrap.

The expansion will not change the relative size of J&L's three plants. The Pittsburgh plant will continue to have 3,097,500 tons of ingot capacity; the Aliquippa plant will continue to be second, with 2,064,000 tons; and the Cleveland plant will be third, with 1,705,000 tons.

Addition of finishing and related facilities at the Cleveland mill will more than double its cold-rolled sheet capacity.

Work is to be started immediately and completed in 1956 and 1957. The newest expansion will raise J&L's plant and equipment expenditures for the 1955-1957 period from $135 million to $250 million.

ODM Allots Defense Metals

The Office of Defense Mobilization has announced metal allotments for production of defense and nuclear products in the first quarter of 1956.

Steel and aluminum allotments are lower than fourth quarter grants, but copper has been given a 4 per cent boost.

The 120 million lb of aluminum compares with 121 million lb in last quarter of this year.

Steel allowances run 642,259 net tons. Fourth quarter grants stand at 654,591 tons.

Copper grants were increased from 58 million lb to 60 million lb.

ODM says that additional amounts of metal will be set aside at mill level for producers of "B" category products — civilian type items which are incorporated into military use.

Metalworking Shows Third Period Gains

	Third Quarter Net Earnings 1955	1954
Acme Aluminum Alloys Inc.	$ 73,727	$ 137,927(L)
Acme Steel Co.	1,412,783	1,073,137
American Steel Foundries	3,770,371	3,626,688
Allis-Chalmers Mfg. Co.	5,583,585	5,832,964
Atlas Tack Corp.	118,073	4,563
Bohn Aluminum Co.	474,065	163,561(L)
Bridgeport Brass Co.	1,238,893	1,027,461
Carborundum Co.	1,213,125	584,850
Caterpillar Tractor Co.	9,035,000	6,955,479
Clevite Corp.	546,474	333,743
Continental Can Co.	9,859,834	8,022,413
Continental Copper & Steel Industries Inc.	662,728	79,207
Electrolux Corp.	591,945	400,188
Federal-Mogul-Bower Bearings Inc.	1,950,337	1,421,192
Ferro Corp.	567,060	444,112
General Bronze Corp.	301,775	310,853
General Electric Co.	39,467,000	42,335,000
General Steel Castings Corp.	652,306	326,951
General Railway Signal Co.	450,262	278,416
Granby Consolidated Mining, Smelting & Power Co. Ltd.	71,751	124,201
Greenfield Tap & Die Corp.	317,391	124,086
Hussmann Refrigerator Co.	$ 791,355	$ 447,195
Intertype Corp.	334,699	259,002
Johns-Manville Corp.	7,178,801	4,683,520
Metal & Thermit Corp.	297,680	384,705
Midwest Piping Co. Inc.	260,277	351,706
Monarch Machine Tool Co.	146,229	169,790
Motor Wheel Corp.	366,449	222,848
New York Air Brake Co.	626,808	409,061
Olin Mathieson Chemical Corp.	12,500,000	8,200,000
Pittsburgh Forgings Co.	40,741	68,368
Pittsburgh Metallurgical Co.	614,068	172,483
Pittsburgh Screw & Bolt Corp.	201,471	32,842
Republic Aviation Corp.	2,700,474	1,599,454
Reynolds Metals Co.	9,667,167	5,196,548
Rockwell Spring & Axle Co.	3,666,034	2,175,411
Simonds Saw & Steel Co.	1,055,481	375,541
Thew Shovel Co.	110,503	87,000
Thompson Products Inc.	2,218,393	2,321,605
Transue & Williams Steel Forg.	60,791	8,808(L)
Union Carbide & Carbon Corp.	37,821,591	21,342,667
U. S. Pipe & Foundry Co.	2,770,300	2,058,192
Westinghouse Air Brake Co.	1,781,157	2,480,253

(L) Loss

METALWORKING companies report high third quarter sales and incomes, with only a few not sharing in the trend.

Monarch Machine Tool Co., Sidney, O., announces low quarterly net earnings of $146,229 on shipments of $2.9 million. In 1954, net earnings were $169,790 on shipments worth $2.8 million.

Strike—Although the company was strike bound for 10½ weeks during the second quarter, President Jerome A. Raterman says: "Our operations are rapidly overcoming the strike."

Allis-Chalmers Mfg. Co. has "slightly lower profits than last year's figure," according to R. S. Stevenson, president. "But company sales were at an all-time high of $396.5 million for nine months, and bookings for the next quarter are higher than 1954's." Third qurater earnings total $5.6 million, compared with $5.8 million for a like 1954 period.

Labor Contracts—"In the third quarter of this year most of our labor contracts were up for negotiation," says Mr. Stevenson. "New contracts covering 23,365 employees in 15 plants have been signed." This should add to Allis-Chalmers' stability in the next quarter and in 1956.

On the other side of the ledger, both large and small companies indicate that the slump in defense contracts has been offset by higher civilian consumption.

Optimism — Typical is Johns-Manville Corp.'s $7.1 million profit in this quarter, compared with $4.7 million last year.

"Metal & Thermit Corp. has entered the nuclear field and 1955 promises to be one of the best years in company history," says H. E. Martin, president. Although the corporation suffered third quarter losses, Mr. Martin states that its nine-month income increased 15 per cent over 1954's.

General Electric Co., Schenectady, N. Y., announces a quarterly net income of $39.5 million, compared with $42.3 million in 1954. Expiration of defense contracts apparently accounted for the quarterly drop of 7 per cent, which was anticipated.

President Ralph J. Cordiner says that nine-month earnings, however, were $141.3 million, against $136.1 million for the same period last year.

"Sales of commercial products were higher during the first nine months of this year than for any similar period," Mr. Cordiner explains. He also notes that orders for large apparatus are running ahead of 1953 and 1954, promising a good level of production and shipments for at least the next two years.

Predictions — "Business for the fourth quarter is expected to be good," predicts R. A. Weaver, board chairman of Ferro Corp., Cleveland. Its quarterly income reached $567,060, compared with 1954's quarterly earnings of $444,-112.

Despite a tightening of consumer credit, unfilled orders lead industry to anticipate high sales and increased profits in the closing quarter of 1955.

Brown & Sharpe Mfg. Co.

The machine tool industry prepares for an emergency as . . .

Phantom Contracts Reappear

MACHINE TOOL BUILDERS aren't going to lose any time getting into defense production in case of another war. Under the terms of proposed government contracts, the builders will be triggered into action automatically without any danger of financial loss.

A three-man task force from industry is ironing out some of the technical and legal details. The final draft should be ready in November, said a Business & Defense Administration official. Contracts should be signed with about 150 builders in three or four months.

The General Services Administration will be the fiscal agency. It agreed in principle with a previous suggested contract drawn up by producers but rejected some of its details.

Plan — Here's how the plan would work: The BDSA would decide how many of each kind of machine tool the Defense department would need. Then on the basis of each company's ability to produce, the government would sign contracts for a specified number of tools. There would be no financing involved at this stage—just a contract.

In event of war, the contract would become effective upon notification, and the builder would speed up production to meet the emergency. To guarantee him against any loss in this process, the government will make available 30 per cent of the cost of the order. It is not certain when the builder will get that 30 per cent or where it will come from, but presumably it will be government money.

Tool builders as well as government officials are enthusiastic about this development. It will save more than a year getting started on a machine tool program. While it doesn't mean business for the industry now, it does indicate what part each manufacturer can expect to play later on.

Modernization Problem — This program will require a constant checking of defense machine tool requirements and obsolescence of tools involved. An Office of Defense Mobilization official said that every six to nine months a study would be made and contracts altered to be sure that, when needed, the tools will be the best available.

The contracts, which the government hopes will be executed during the current fiscal year, are authorized under the Defense Production Act, which expires on June 30, 1956, unless Congress extends it. Congress has made no specific authorization for this program, however, and some officials see this as a major obstacle to its success.

The government does not intend to buy any tools under this plan. It is anticipated that in any emergency all tools produced would be sold to defense contractors or other private businesses. However, if a company overproduced under the contract and got stuck with excess tools, the government would undoubtedly buy them—the contract guarantees producers against loss.

DOD Urges Standardization

To conserve critical raw materials, Thomas P. Pike, assistant defense secretary, has urged more standardization between government and industry in the production of military hard goods.

Mr. Pike was guest speaker at the meeting of the National Conference on Standards in Washington. His staff presented suggestions on cataloging, standardization and quality control programs.

Gray Iron Plots Future

To meet changing market conditions, Gray Iron Founders' Society launches extensive research and product development programs at its annual meeting

"SOME 13 million tons of gray iron castings will be shipped this year, about equal to the 1953 level."

That's how Don H. Workman, executive vice president of the Gray Iron Founders' Society, summed up prospects at the society's 27th annual meeting in Milwaukee, Oct. 20-21.

Trend—But he added: "While the number of companies in the overall foundry industry has grown since 1948, some 600 gray iron plants have been lost. Competition for gray iron business is uncomfortably keen, and the bulk of 1955 shipments will come from captive shops."

To meet this challenge, C. R. Culling, of Cardondelet Foundry Co., St. Louis, announced that the society will start a market research and product development program. A market analyst will be added to the society's staff.

Objectives—Size, type and location of market areas will be studied. Members will be assisted to sell on the basis of product value rather than price. The idea that gray iron castings are precisely manufactured items rather than a bulk commodity will be promoted. New uses will be sought, and expanded promotion of the physical virtues of gray iron castings will be started.

Society Officers — Charles H. Ker, Dalton Foundries Inc., Warsaw, Ind., was re-elected president. J. Scott Parish Jr., Richmond Foundry & Mfg. Co., Richmond, Va., was elected vice president. Re-elected as secretary and treasurer, respectively, were C. H. Meminger, Posey Iron Works, Lancaster, Pa., and W. O. Larson, W. O. Larson Foundry Co., Grafton, O. Mr. Workman continues as executive vice president.

CHARLES H. KER

Re-elected President GIFS

Members voice concern over procurement policy as . . .

NMTBA Holds Annual Meet

LOUIS POLK

Elected president NMTBA

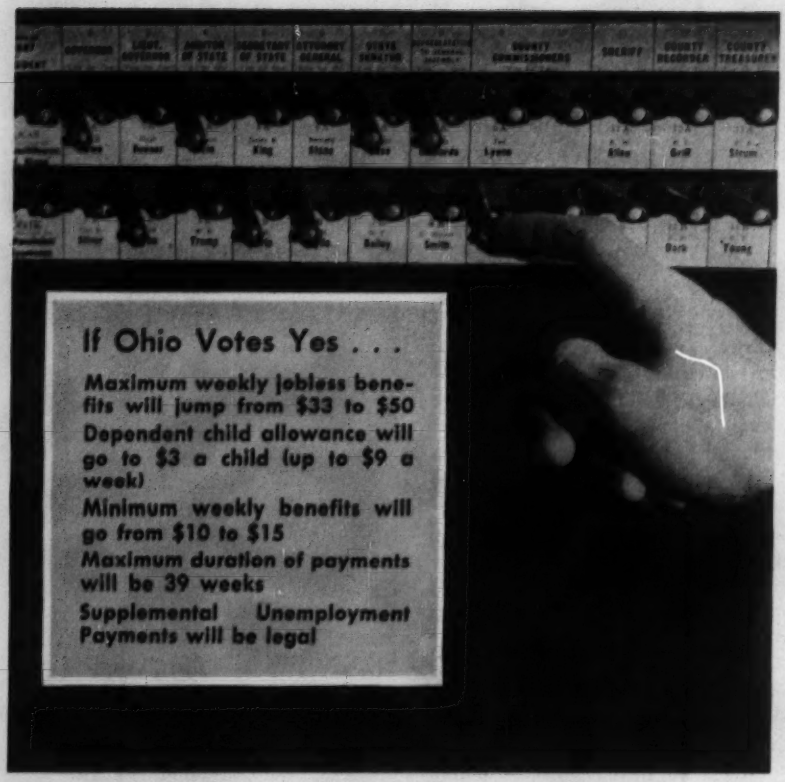
JEROME A. RATERMAN

Elected first v.p. NMTBA

"WHAT'S happening to long-lead-time tool procurement?"

That was a leading question at the 54th annual meeting of the National Machine Tool Builders' Association in New York last week. Rumor has suggested that the Defense department may call off the $100-million annual purchase program. Said Everett M. Hicks, chairman of the associations' Government Relations Committee: "Unless the program is speeded up, Congress may begin to have serious doubts about whether the armed services really need the additional capacity."

Officers—In addition to the election of Mr. Raterman and Mr. Polk, the following won office: A. V. Bodine, second vice president and director; P. G. March III, treasurer; W. E. Rutz, secretary. R. E. Cross and C. S. Davis Jr. were added to the board. Tell Berna, general manager for the last 18 years, was elected executive vice president.


If Ohio Votes Yes . . .
Maximum weekly jobless benefits will jump from $33 to $50
Dependent child allowance will go to $3 a child (up to $9 a week)
Minimum weekly benefits will go from $10 to $15
Maximum duration of payments will be 39 weeks
Supplemental Unemployment Payments will be legal

SUP Goes to Ohio Polls

ON Nov. 8, Ohio voters will make their X on a CIO-UAW sponsored addition to the regular ballot (see above). Their decision will influence the course of national labor negotiations.

If they turn thumbs down, it will be a major victory for opponents of Walter Reuther and Supplemental Unemployment Pay. If they vote yes, not only will SUP be made legal in Ohio, but the major part of its cost will be saddled on the state unemployment compensation funds. It will be much easier for Mr. Reuther to sell new programs to industry, much easier to expand existing ones.

Precedent — Nationally, integration of state funds and SUP is still in the fighting stage. A favorable vote in Ohio could sway the balance in favor of the CIO. The U. S. Chamber of Commerce says that in at least 22 states there will have to be special laws to permit integration. In Michigan, New York, Connecticut, Illinois and Massachusetts, where recent decisions would seem to legalize SUP, the National Association of Manufacturers and other bodies are preparing court fights.

What's going to happen in Ohio? Spokesmen for each side are confident. The struggle is emotional. One CIO slogan runs "shoes for our children." Gov. Frank Lausche, allied with the opposition, calls the whole business "fantastic."

Battle Lines—Privately, authorities say the CIO will carry at least the manufacturing areas, though it may lose some of its potential worker vote in Cleveland. There, the mayor and 21 of 33 councilmen are already re-elected, and the vote is expected to be light. But the CIO has been working on the issue for months, has experience in drumming up votes and has money to spend.

The Ohio Information Committee, formed to combat the CIO, has members from industry, from politics, from the churches and schools. Republic Steel Corp., Thompson Products Inc., Standard Oil Co. of Ohio, Eaton Mfg. Co. and National Malleable & Steel Casting Co., all of Cleveland, have representatives on one of the executive committees. Their efforts probably represent a first in cooperative public relations.

Opposition Commentary — "Our law is now tight, well enforced and adequate; the CIO proposal is an invitation to slackness . . . Small companies will be hardest hit. The state will have to raise $47 million more; $21 extra a year will have to be found for each employee by the average company . . . Though this might help us pay for a SUP contract, it could cripple many small companies which are our best customers."

The CIO figures that few Ohio workers will object to voting themselves a raise. It's betting that the package will appeal to union and nonunion workers alike. If it succeeds, its next move will be to push a similar proposition in Michigan and the other key states.

Pension Funds Rise

Nearly $1.8 billion was added to the pension funds of U. S. corporations last year. The Securities & Exchange Commission estimates assets were $11.2 billion at the end of the year.

The number of corporations having noninsured pension funds increased about one-third from 1951 to 1954. Total assets were $6.4 billion at the end of 1951.

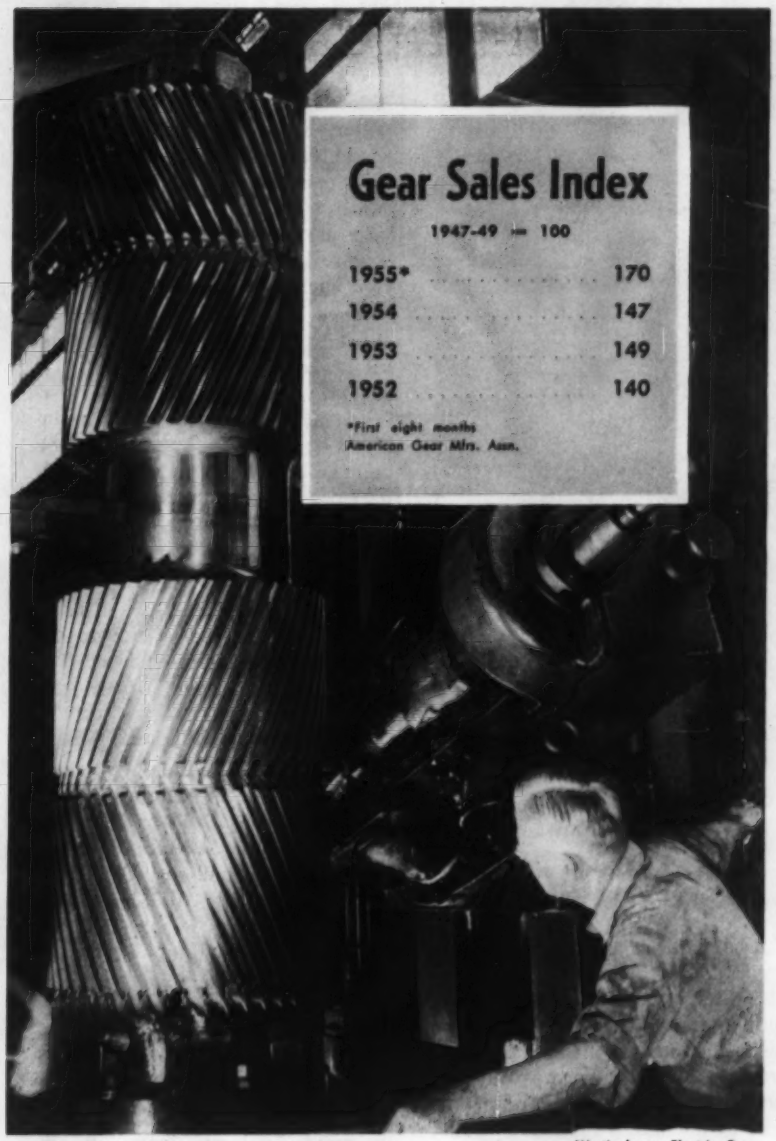
Most of the growth in pension funds has been invested in corporate stocks and bonds. Bonds alone total over $6 billion; government securities are $2 billion, common stocks are almost $2.1 billion.

Income from interest and dividends last year was $379 million.

Steel Gets Fast Tax Write-Off

Bethlehem Steel Co. will be allowed accelerated tax amortization (50 per cent) on its $30.1-million facility for heavy steel plate at Sparrows Point, Md.

Certificates for 37 facilities, totaling $93,120,648, were issued in the two-week period ending Oct. 5.



Westinghouse Electric Corp.

Hobbing a double pinion gear for a steel mill drive

Gearmakers Aim at Record

GEARMAKERS hope to ring up sales of $290 million this year, compared with an estimated $250 million last year. The first half of 1956 should maintain the same pace as the last half of 1955.

"Sale of gears in 1955 should exceed 1954 volume by at least 15 to 20 per cent," predicts Marvin R. Anderson, president of American Gear Manufacturers' Association. Last week in Chicago at AGMA's semiannual meeting he told members: "Business in 1955 will be 5 to 10 per cent better than in 1953." Mr. Anderson is with Michigan Tool Co.

AGMA's index for the first eight months of this year indicates a 20 per cent increase in gear sales during that period, says John C. Sears, the association's executive secretary. Gearmakers expect 1955 to set a new record.

Looking Ahead—Gear customers range from watchmakers to builders of heavy mill equipment. Applications are so diverse that sales managers agree that their volume accurately reflects general metalworking volume.

In Cleveland, George F. Stahl, president of Stahl Gear & Machine Co., says increased steel mill operations account for a 10 to 15 per cent increase in 1955 sales. Machine tool purchasing, slow in the first half of the year, is gaining strength. Builders of lift trucks and roadbuilding equipment are also good customers.

Mass production industries furnish most of the push behind improved gear sales. "Their maintenance requirements boost gear demand," reports Carl E. Overton, vice president, sales, Brad Foote Gear Works Inc., Chicago.

Slow Industries Recover—Inactivity in several large consuming industries slowed gear sales in 1954. Examples: The textile industry, shipbuilders and mine machinery outfitters. Now there's demand among these users.

"Bulk of the sales increase this year is in general industrial gearing and speed reducers," points out AGMA.

Men Wanted—Clouding the gear outlook are: 1. A lack of skilled machinists in some areas. 2. Difficulty of obtaining enough steel forgings, castings and bar stock. 3. A low profit margin.

"Our problem is persuading customers to wait three or four months for delivery of gears which were shipped in less than half that time last year," says a Philadelphia maker.

No Surplus—An AGMA survey last year showed that profits of custom gear cutters are declining. This trend continued into 1955 as several captive shops used idle capacity for commercial production.

Customers will wait patiently for gears, but they demand highest quality when the product arrives. "Making gears to customer specifications is a highly competitive task," say officials of Simonds Gear & Mfg. Co., Pittsburgh.

Other gearmakers agree that they can solve problems of tough competition and slim profits by continuing to turn out a high quality product.

NEA

On the heels of Hurricane Diane comes the search . . .

Can You Insure for Floods?

THE HUE AND CRY for flood or disaster insurance is under way.

President Eisenhower says he will suggest some kind of federal disaster insurance to Congress. Formation of a federal corporation to provide direct insurance or reinsurance against floods has been discussed. Congressional hearings begin today (Oct. 31).

Dead End—But it's generally suspected that not much in the line of insurance will be accomplished. More likely: More flood control projects.

The desirability of disaster insurance isn't disputed. The stumbling block: Costs are prohibitive. Estimates of average annual flood losses run as high $500 million.

Subsidies — After the big Midwest floods of 1951, the Insurance Executives Association (now the American Insurance Association) had an extensive damage survey made by an independent engineering firm. The conclusions are still generally valid, say insurance people.

A committee of the association wound up a summary of the report like this: "It is our considered opinion that insurance against the peril of flood applicable to fixed property cannot successfully be written and that any specific promise of indemnity for loss by flood must therefore be regarded as in the nature of a subsidy or relief payment, which is quite outside the scope of private business and of insurance . . . There is no reason to believe that the government would encounter fewer obstacles (in providing flood insurance) than private insurers . . .

Public Interest — "As a long-range program it appears that an accelerated flood control program supplemented by necessary relief payments would be more in the interest of the public than a program of so-called 'flood insurance' which could not be self-supporting."

That would seem to put a damper on the plan discussed under sponsorship of the Housing and Home Finance Agency. Frank J. Meistrell, deputy HHFA administrator, says any plan developed would be based on greatest possible participation of private companies. The government should take part only to the extent that private industry is unable to provide such insurance at the outset.

Move Out — "If the operation should prove feasible or successful at some future date—say five or six years from now—the government should withdraw its interest and private industry, having had the benefits of government experience and assistance in the field, would then acquire the business exclusively," he adds.

The insurance industry is thinking it over.

More concrete assistance to the distressed areas is in evidence. The armed services have placed over $81 million in defense contracts in the area hit by Hurricane Diane.

Shortage — The Small Business Administration is running out of money for disaster loans. Applications total over $32 million and may hit $40 million. Of those, some $28 million to $30 million may be eligible.

So the overrunning of SBA's $25-million disaster loan quota has the O.K. of the White House. Temporarily, additional disaster loans are being made as regular business loans.

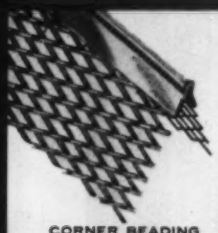
Disaster loans bear 3 per cent interest; business loans, 6. So prompt action is promised when Congress reconvenes to get 6 per centers converted retroactively to 3 per centers.

Nickel Bonus

Continued diversion of scarce metals from stockpile and Defense Production Act deliveries looks probable. Latest: 3 million lb of nickel for industry in November and a like amount in December.

Estimates are that nickel supply will catch up with demand sometime in 1958. Continuing diversions on that and other tight metals have practically blanked out any more mention of possible government controls.

The Shapes of Things to Come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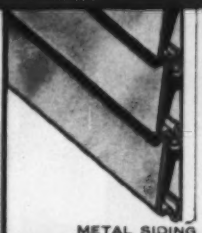
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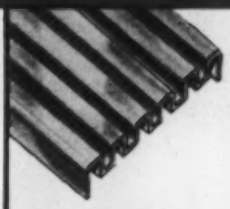
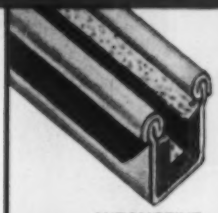

METAL DECK—FLUTING

STAINLESS—GALVANIZED TRIM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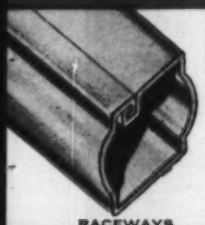
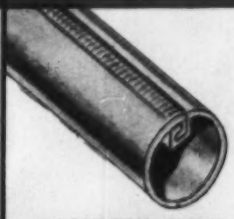

RACEWAYS


LOCK SEAM TUBING

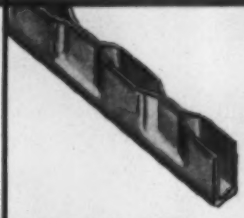
WINDOW SECTIONS

MOULDING

NAILING FLANGES

LOCK SEAM BOX SECTIONS

METAL ROOFING


IRREGULAR PATTERNS

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SHEET and STRIP FLANGING

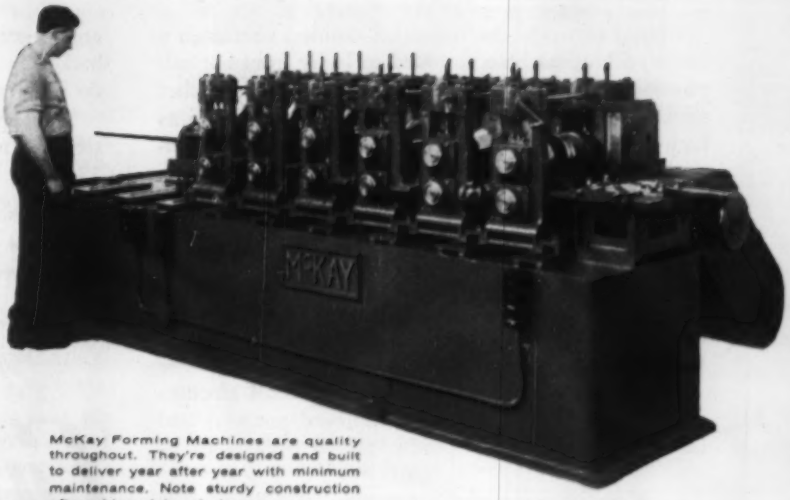
Call for McKAY FORMING MACHINERY

Two words that best describe McKay Forming Machines are "precision" and "ruggedness."

McKay Forming Machines are the last word in quality. They're designed and built to perform with extreme accuracy year after year. McKay users the world over know that quality is never sacrificed, even in the smallest details, for the sake of marketing a "cheaper" unit.

And McKay Forming Machines are built to customers' requirements with an eye to the future. They're machines that will not only meet today's needs, but machines that are ready for the faster speeds, tougher metals and more intricate shapes of tomorrow.

Be sure you have checked with McKay before you order forming equipment. You'll find this unmatched precision and ruggedness pays off in better forming at greatly reduced costs. And with a McKay—you're ready for tomorrow!



McKay Forming Machines are quality throughout. They're designed and built to deliver year after year with minimum maintenance. Note sturdy construction of machine pictured above.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

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He called in the specialists who developed industry's first sulphuric acid-resisting stainless in rolled form. This unique Carpenter Super Alloy was a natural. After many months of continuous use, the new nozzles show no signs of corrosion. Eliminating frequent shut-downs has boosted battery production and reduced costs substantially.

Isn't there a place in your company for Carpenter men to work with you toward improved products and easier, more economical production? A wide range of quality steels for virtually any critical application are backed by able and conscientious people who want to do business with you.

The opportunity is here. You can initiate this forward step in your plant by sending for a copy of Carpenter's 32-page book, "Service on Specialty Steels." *The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.*

Are you taking advantage of these specially-engineered steels as made by Carpenter?

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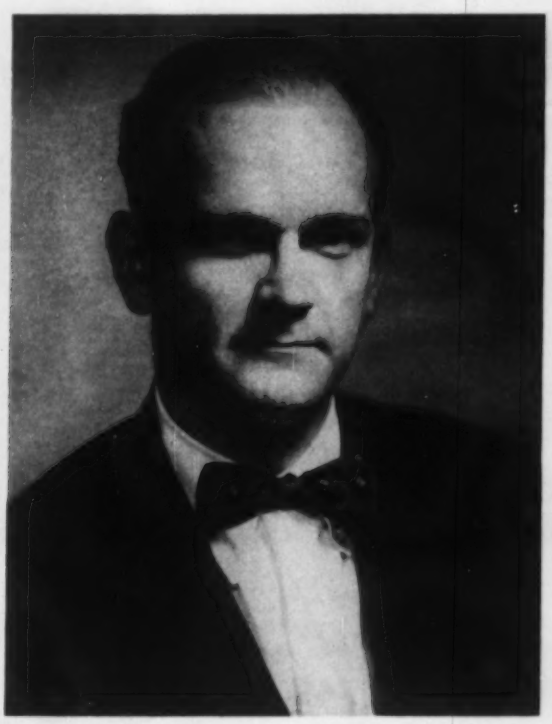
Carpenter STEEL

for product improvement



T-P's Blackall Probes the Product Mix

HIS BIGGEST long-range job is to shift the balance in the product mix by adding more bread and butter to the recipe.

F. Steele Blackall III is the man behind a new five-year plan at Taft-Peirce Mfg. Co., Woonsocket, R. I. As vice president and assistant general manager, he's thinking in terms of more standard product business.

T-P makes a standard line of machine tools, gages and tool-room equipment. It also has a large contract service division that makes special equipment of all kinds.

Longer List—The machine tool line consists of a small surface grinder, a rotary grinder, a hand lapping machine and back spot facer. Mr. Blackall would like to extend this list to as many as ten. Part of the answer may lie in getting U. S. rights to a good foreign machine tool.

Problem Solver—"Gaging is becoming increasingly important to us, but we seem to get the toughest jobs handed to us." He feels that his company is not getting a big enough slice of the standard gage business. One T-P computing air gage, for example, enters several sets of readings into a simple air circuit and then uses them to get a calculated answer. With this one there's no standard. "We get a new problem every time."

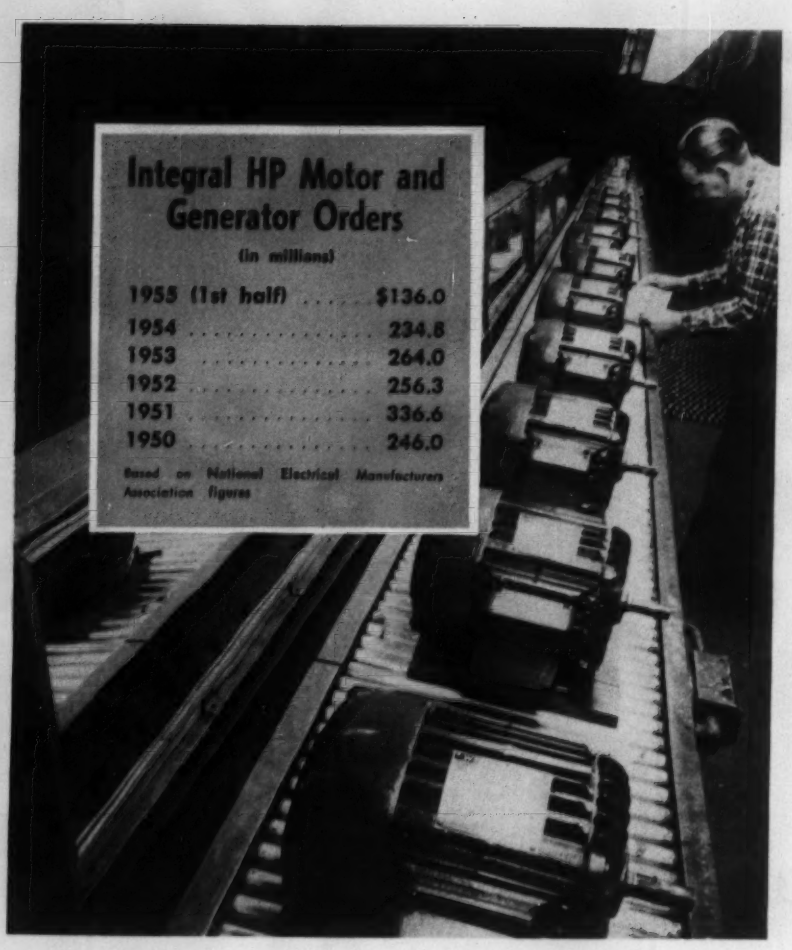
Although he's proud of this reputation, Mr. Blackall says: "We're trying to get something new in gages that will make us stronger in standard applications. We're now working on a couple of ideas." He figures T-P's crack product research department will come up with the answer.

"Our toolroom equipment (V-blocks, surface plates, etc.) is as close as we come to a bread-and-butter business. We're also putting more sales effort in our magnetic chucks.

"Without sacrificing any of our reputation as a handler of the tough jobs, we'd like to increase this standard product business from its present 60 per cent of the total to about 80 per cent."

Background—With a mechanical engineering degree from Yale and a master's degree in business administration from Harvard Business School, Mr. Blackall is equipped to tackle the problem.

He has a wife and two children to share his already diminishing free time. They, he says, are his hobby. There's no longer room even for two of his favorite pastimes—bridge and chess. Although he's won important tournaments, he considers himself semiretired from competition.



Westinghouse integral motors roll past an inspection point

Motor Sales Whirl

NIP AND TUCK WITH '53—that's how producers of integral horsepower motors and generators are summing up the sales outlook for this year.

The industry will pass its 1954 total of $234.8 million (see table) without much trouble but may have a harder time beating the $264-million mark registered in 1953—the second best year in the industry's history. Due to the Korean War, the record year was 1951 ($336.6 million).

Statistics—Orders for integral horsepower motors and generators during the first half of this year totaled $136 million, according to a compilation based on figures issued by the National Electrical Manufacturers Association. At this rate, volume for the industry should run over $272 million. But business during the last half appears to be falling off, say industry spokesmen.

M. E. Knudson, manager of motor sales, Motor & Control Division, Westinghouse Electric Corp., says: "We believe that our orders for integral horsepower industrial motors will recover in 1955 to about the 1953 level, which was the peak except for the surge at the time of Korea. But due to the lead time on some kinds of motors, shipments will not quite equal 1953's totals."

On the other hand, S. K. Hostetter Jr., general manager, Crocker-Wheeler Division, Elliott Co., anticipates that this year's industry totals will only rise from 7 to 10 per cent over 1954's. Mr. Hostetter feels that the current half will be good "due to high activity in all industries — business should hold up well." Point to remember: Seasonal and end-of-the-year declines will have to be taken into consideration.

Standards — After some four years of study, an important phase of an industry standards program is about completed. The program affects frames (326 and smaller) and alternating-current motors (30 hp and smaller). Substantial reductions in the size and weight of ratings have been inaugurated without disturbing the NEMA performance standards for torque, starting current, temperature rise, etc. Compared with previous ratings, the new standards provide about twice the horsepower per given frame. Rerating of frames 264 through 445 is getting under way, and attention is being directed to the performance and dimensional standards of industrial current motors.

Imports—The government import classification for motors includes not only stationary but "railway, vehicle and others." Last year's total was only $2.4 million. First half imports this year reached the $1.2 million mark. During the last two and a half years, the United Kingdom has been the major exporter of this equipment to the U. S.

Speakers Hit 2000 Mark

Republic Steel Corp. speakers have given 2000 talks to civic groups in six plant cities.

Since the first talk was given five years ago, the corporation's sole aim has been as straightforward as peas and baked potatoes: To provide speakers for neighborhood and luncheon groups on topics of local and general community interest.

Volunteer speakers from Republic speaker's bureaus have discussed the St. Lawrence Seaway with a Cleveland audience. Birmingham, Ala., residents heard a talk on combating local juvenile delinquency.

Sylvania Products' electronic computer system helps . . .

Executives Get the Answer

AN AUTOMATIC BRAIN will gather data from 51 cities for executives of Sylvania Electric Products Inc.

Donald G. Mitchell, chairman and president of Sylvania Products, told a congressional economic subcommittee on automation that the private electronic unit will be ready for use by next January. It is being engineered by Sylvania and Western Union.

According to Mr. Mitchell: "The 12,000-mile wire system will tie together all of our plants, laboratories, warehouses and sales offices with executive headquarters. Financial and production information will come over the leased network to a data processing center near Syracuse, N. Y. There it can be instantly summarized for all management levels."

Giant Brain—"Heart of the system," Mr. Mitchell said, "is the Univac machine which Sylvania will lease from Sperry-Rand Corp. It will gather, compute and classify information on production volume, sales, billings and other subjects.

"As we gain experience we fully expect to broaden its activities to such fields as market research and engineering analysis," he added.

Aid to Labor—In telling the subcommittee about Sylvania's new system, Mr. Mitchell took sharp issue with labor leaders' fears that the trend toward automation would cause unemployment.

Increased mechanization, the industry executive stated, is the only way to avert a probable labor shortage in the years ahead.

"Last year's near record output of goods," Mr. Mitchell said, "would never have been possible were it not for the production techniques learned during and since the war."

Donald G. Mitchell, chairman and president of Sylvania Electric Products Inc., tells a congressional subcommittee that automation means more employment

Pennsy Reorganizes System

The Pennsylvania Railroad will adopt a new organizational setup Nov. 1.

As revealed by James M. Symes, the Pennsylvania's president, the plan calls for nine regions to take over the duties of three regions and 18 divisions.

Regional managers will be autonomous, except for over-all system co-ordination and authority.

Mr. Symes calls the plan "somewhat revolutionary in the railroad industry." He adds: "The key to its effectiveness lies in the fact that each regional manager will be responsible for every phase of operation and service in his territory. He and his staff not only will produce transportation, but sell and promote it."

All regional managers will report to one vice president.

Existing system departments (finance, legal, purchases, public relations and secretarial) will remain about the same.

Consent Decree Settles Suit

The government has settled an antitrust suit which charged five companies with monopoly manufacture of freight car parts.

Defendants were: American Steel Foundries, Chicago; Buckeye Steel Castings Co., Columbus, O.; Scullin Steel Co., St. Louis; Symington-Gould Corp., Depew, N. Y.; and Foundries Export Co. Inc., New York.

Charges: Devising a patent pool to help hinder competition in the casting of freight car undercarriage parts (side frame and bolsters), price fixing and allocating business among themselves.

Decree: It prohibits continuation of the alleged restraints and requires the defendants to grant U. S. manufacturers royalty-free licenses under their patents. These companies also will get manufacturing drawings at cost and can participate in some joint engineering projects.

Within the Span of a Man's Hand

The power to transmit the commands of the operator *to the machine* . . . . . .

By means of the movable PENDANT CONTROL the start and stop of the spindle; selection of speeds, feeds and directional movements of all heads in feed or traverse are quickly and easily accomplished. Interlocks and a stopall stick provide safety for both operator and machine.

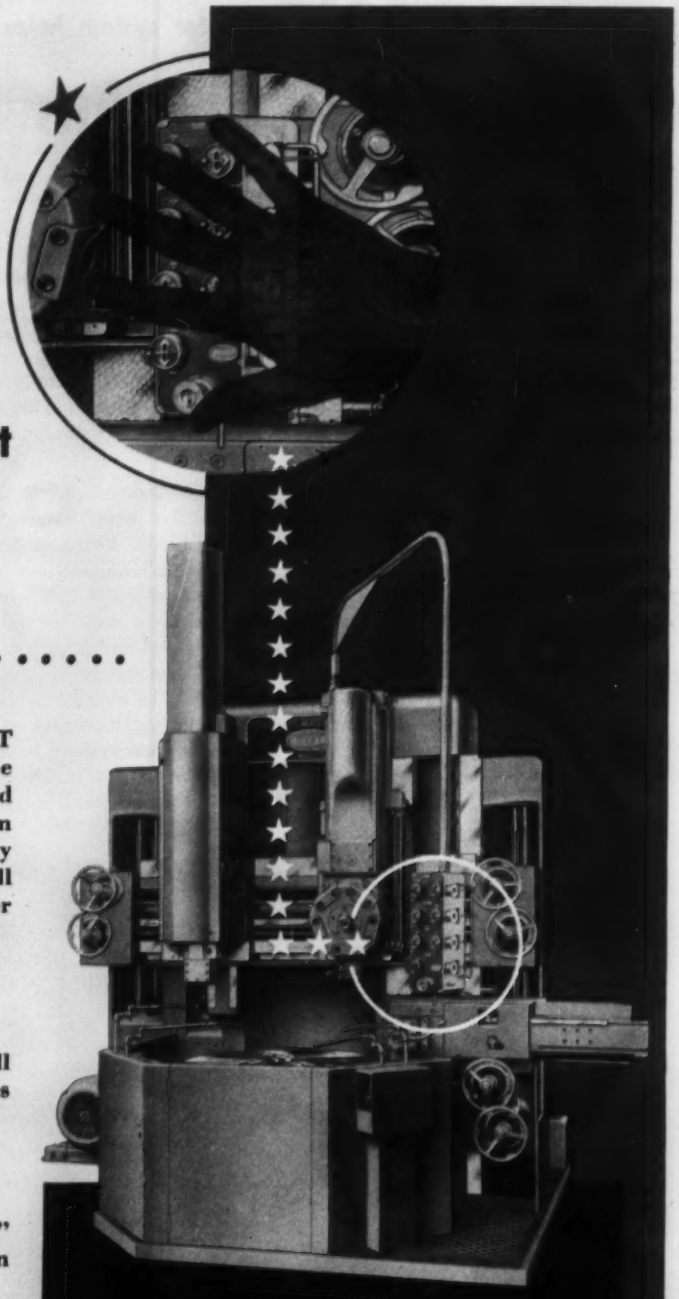
Additional features include:

SCREW FEED

for vertical and horizontal motion of all heads — to assure fine smooth finishes with greater accuracy.

POWER INDEXED MAIN TURRET (optional)

Five sided turret for "run of the mill" jobs. Four sided turret for production jobs.



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By FLOYD G. LAWRENCE *Detroit Editor*

How Auto Costs Are Figured

Engineers, designers, buyers must stand with one foot four years into the future when they come up with cost-influencing decisions. They're working on 1960's now

AS 1956 models hit the roads amid shouts of "New, All New" from professional jubileers, auto engineers are quietly beginning to work on 1960's.

By the same token, the glistening stuff quickening the pulse of the public today was conceived back about 1952.

One of the minor marvels of the auto business is the way engineers can speak glowingly about cars they have outmoded three times over on their drawing boards.

Cost, Cost—Manufacturing costs are a major factor in this telescopic approach to the future. That condition also makes remarkable the fact that, despite four years of groundwork, prices are announced by most auto firms about 10 minutes before the first customer walks into the showroom. But let's start at the beginning of a story that will make most metalworking men concerned with cost happy with their lot.

The car really begins with the forward product planning group. These men determine the size of the car, whether it will be completely new or a facelift and how much it will cost. Fundamental in cost computation, of course, is an estimate of how many units will be sold, and it is here that the foundation of the auto business rests firmly on shifting sands.

Evolution — Having arrived at the package concept which the planners can only guess will be competitive with other cars being spawned at the same time, forward planning calls in the stylists for one. They prepare sketches of what the package ought to look like. Stylists preparing such sketches for one auto firm, incidentally, are in great demand by others. They frequently trade jobs, which keeps the industry progressing somewhat as a unit.

After sketches are presented, forward planners call in engineering and process development people to look over the basic designs for practicality. They determine not only if the car can be built but whether it can be built within the cost objective based on the predicted sales volume, an art strangely blended with science.

Debating Stage—Obviously, this takes plenty of design changes amidst wrangling between stylists and process people. Lasting for several months, this is the stage that most automakers are in right now on their 1960 models. Ultimately, a basic body configuration will be decided upon and the divisions of the corporation will step in to claim the version that they feel will appeal most.

Models one-eighth to scale are built, and the engineering and process people again check them for feasibility. If things still look good, a full-sized model is built in clay, and the estimating really gets down to what may jokingly be called a science. That's because estimators are using existing material and labor costs. They can change plenty in a few months, let alone a few years. So can an estimated volume of production, which has the solidity of a wet Kleenex.

Down to Mills—Be that as it may, body and chassis experts determine exactly what parts will be needed for the car and spell out to the mill the cost of each. This is related on a plus-or-minus basis to comparable parts of current models and existing technology and costs. Revised every week or two by most auto firms, these reports highlight areas for resolution where cost of the new models is likely to be out of line with the old.

These reports give the automakers a running idea of where they stand relative to their target as it comes more closely into view. They continue right up to the time the car goes into production. For parts considerably out of line, either new technology must be developed to remedy the situation or the company must reach a decision on whether to substitute another part or retain the cost penalty. If the cost penalty is to be retained,

A modified Hydra-Matic highlights Pontiac changes for 1956. A filling and emptying torque converter provides smoother, quieter shifting. Horsepower is boosted to 227 in the Star Chief line. Four-door hardtops come in all series

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cost must be taken out of other parts to handle the increase.

Compromise — Here once again art and science intermingle as automakers attempt to determine which extra-cost items can be eliminated while still keeping the car competitive on the showroom floor. Two interior dome lights may be replaced with one, a chrome strip may be shortened or eliminated, a towering fin on the rear fenders may be reduced to a mere fillip, or lush interior fabrics may be replaced with less costly material.

It's here that the automakers hold their grip on mental comfort. Changes of a minor sort can be made right up until a month or two before production starts when the competitive picture is relatively clear. A complete grille, for example, was dropped by one automaker only two months before production started, when it was learned a competitor was beating him to the punch with the same design. Similar turnabouts can be made to effect cost savings. While the total cost flexibility utilizing such changes is something the automakers do not care to talk about, 10 to 15 per cent is reported by one source.

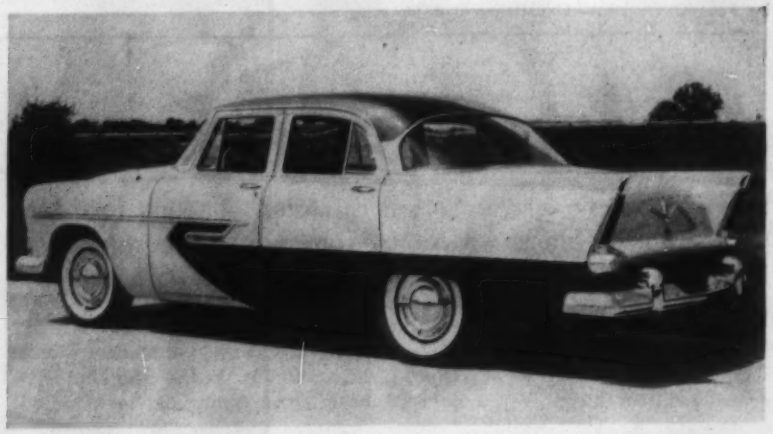
Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	913,257	621,318
June	825,031	635,540
July	815,324	543,344
August	736,039	523,799
September	567,717†	364,156
October		312,078
November		616,395
December		761,954
Total		6,896,678

Week Ended	1955	1954
Sept. 24	151,804	72,804
Oct. 1	144,534	84,110
Oct. 8	102,079	81,610
Oct. 15	130,778	59,511
Oct. 22	171,939†	62,376
Oct. 29	165,000*	90,662

†Preliminary *Estimated by STEEL
Source: *Ward's Automotive Reports*



Plymouth brings pushbutton shifting to the low-priced field in 1956 cars equipped with PowerFlite. "Flight fins" on rear fenders keynote style changes. All four lines offer 200 hp with Power Pack. Plymouth now makes its own power plants

Factory Test—At the time of the new model announcement, the cars usually have been in production several weeks. That gives the automaker his final double-check on costs as determined in production and accounts for the last-minute price announcements. Automakers don't report how much their original estimates four years ago differ from the costs as finally determined in production. Actually, it isn't too important in the over-all picture.

For the automakers this process continues right on into production, and changes in materials and methods often are made during the model run. Volume is watched closely and any sign of lagging below the estimate is met with renewed sales vigor. The automaker approach of targeting in on car cost from the time it is conceived until the model is run out nearly five years later is perhaps unique in American industry. But this constant preoccupation with cost is something shared by wise management men throughout metalworking.

Exhaust Notes

Keep an eye on Volkswagen. This German automaker plans to sell about 250,000 units annually in the U. S. after its New Brunswick, N. J., plant hits the groove. Engineeringwise, incidentally, VW cars get the plaudits of American auto engineers. For functional efficiency, it's hard to top these machines which utilize such techniques as employing the frame for heater ducts to pick up the heat of the engine circulated by the cooling fan, etc. But engineers wonder if many people other than engineers appreciate that kind of efficiency!

Speaking of engineering, the limited slip differential offered by Packard as optional equipment is expected to be picked up by other manufacturers as a catalog item for racing. Dirt trackers running with locked rear ends these many years will find the device to their liking on the stock car circuits.

Also new from Packard in 1956 is pushbutton shifting with Ultramatic equipped cars, hottest engine in the industry with 310 hp and 405 foot pounds of torque at 2800 rpm and 10-to-1 compression ratio. Engineers report the engine operates well on present premium fuels rated at about 94 octane due to mechanical octanes inherent in the engine design. It's interesting to note that Packard chose to give some of the added performance the heave ho in favor of economy. A 2.87-to-1 rear axle ratio adds about 20 per cent to fuel economy, it is reported.

Cadillac offers 305 hp in its top models, which include the new sedan de ville, a four-door hardtop, and the Eldorado Seville, a hardtop version of the convertible Eldorado now being built. New grilles, rear fender styling, wheel discs and the improved Hydra-Matic also bolster the Cadillac line.

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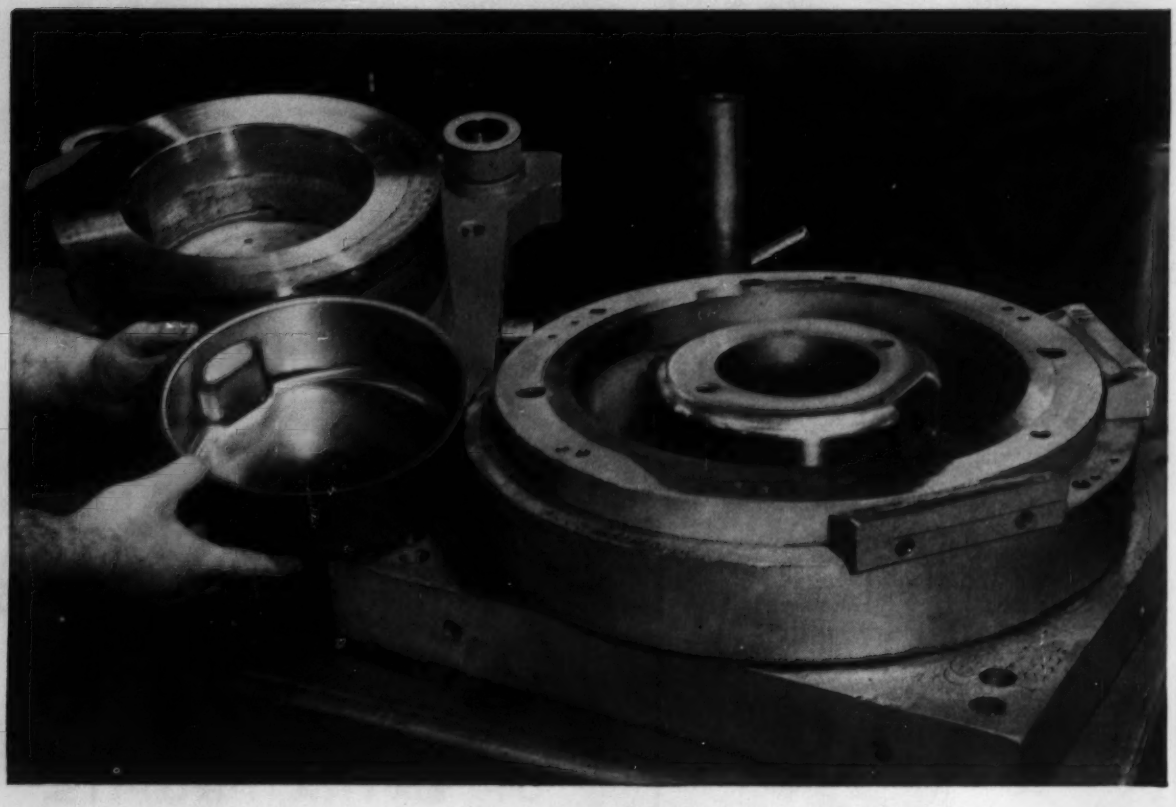


General Electric Department keeps blank and deep draw rejects under 3% with Graph-Mo® tool steel die

AIR chambers for General Electric Swivel Top Cleaners require a 3¼" deep draw. Yet they have to be stamped out rapidly with a minimum of rejects to keep up with production requirements. General Electric Vacuum Cleaner Department in Cleveland, Ohio, turns out an average of 333 air chambers per hour with less than 3% rejects by using a Graph-Mo® tool steel die.

Rejects are held down because Graph-Mo tool steel has a unique structure, diamond-hard carbides, plus unusual ability to retain lubricants on the wearing surface. This prevents excessive scuffing and galling even in tough draws like this.

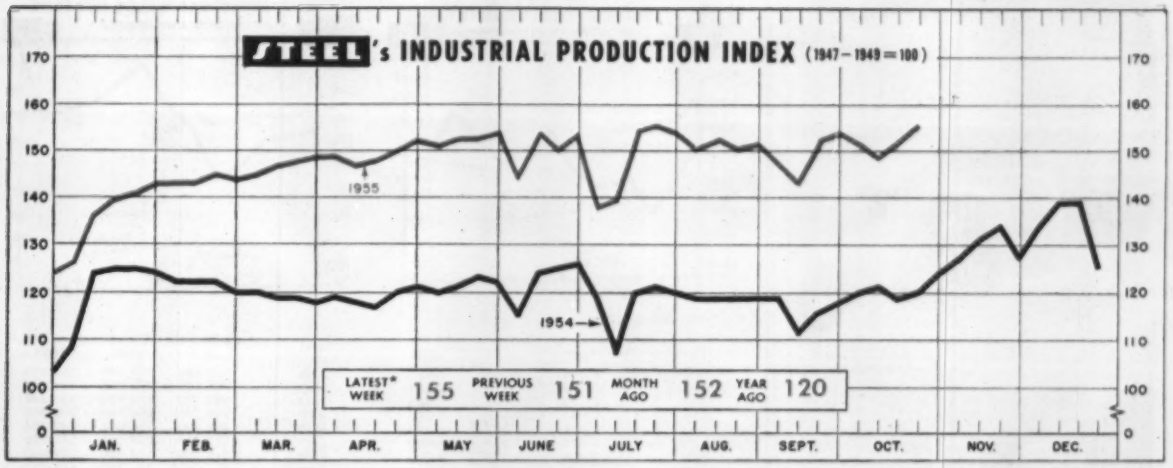
Result: The Graph-Mo steel die wears extremely well. Many users report that Graph-Mo steel outwears other tool steels 3 to 1.

Machining is fast because Graph-Mo steel machines 30% easier than conventional tool steels. And it has uniform response to heat treatment, completely eliminating distortion.

Graph-Mo is only one of four graphitic tool steels developed by the Timken Company. For more information about all of their uses in dies, punches, gages and machine parts, send for the new 10th edition of "Timken Graphitic Steel Data Book". Write to: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Oct. 22. Based upon and weighted as follows: Steel Output, 35%; Electric Power Output, 32%; Freight Car Loadings, 22%; and Auto Assemblies, 11%

Employers Confident, Plan More Hiring

SIGNS OF MORE business pickup ahead: Factory employment is on the upswing again. The workweek took a bigger than usual jump in September.

Helping to keep things moving: Nonfarm employment is at an all-time high; so is the purchasing power of the worker's paycheck.

More Buying—The longer workweek and a 2-cent increase in average hourly earnings pushed take-home pay up about $1.25 last month. So despite a slight rise in consumer prices, buying power is greatest ever (up about 7 per cent from a year ago).

Indications are that people are taking advantage of it. Consumer spending is continuing upward; savings are hardly holding their own.

Add Workers — Earlier this month the Labor department reported employers in three-fifths of the nation's major employment centers expect still higher employment through mid-November. Manufacturers, apparently more optimistic than some other employers, expect payrolls to grow for several months, though the increases won't be so large as earlier this year.

Durable goods lines generally are scheduled to continue upward. Big pusher will be the auto industry which is in high gear for a try to repeat record 1955. Also to gain: Aircraft, shipbuilding, farm machinery, appliances.

Any dips are expected to be small and mostly seasonal.

Keyhole View — The Cleveland area, noted for the diversity of its industry, may give a condensed picture of the national scene. Wage and salary employment is at the highest level in 21 months. Manufacturing employment is down a little for the first time in about a year—but the big causes are labor-management disputes and auto change-overs rather than any general business slackoff.

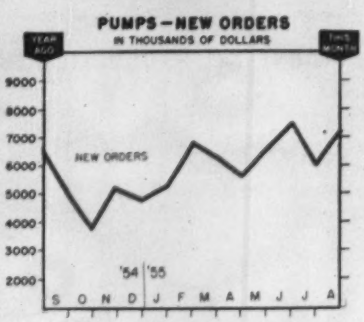
When contacted, 294 employers planned to hire or recall about 3150 workers by mid-November. Manufacturers — headed by pri-

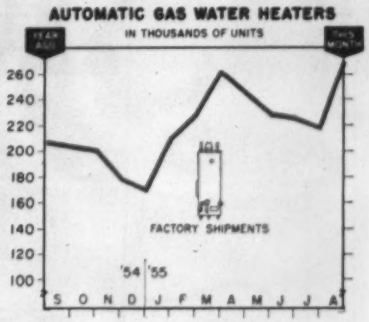
BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,370[1]	2,386	1,769
Electric Power Distributed (million kw-hr)	10,620[1]	10,599	9,117
Bitum. Coal Output (1000 tons)	9,755	9,790	8,290
Petroleum Production (daily avg—1000 bbl)	6,695[1]	6,714	6,196
Construction Volume (*ENR*—millions)	$420	$346	$323
Automobile, Truck Output (*Ward's*—units)	171,939[1]	130,778	62,376
TRADE			
Freight Car Loadings (1000 cars)	820[1]	827	721
Business Failures (Dun & Bradstreet, no.)	205[1]	203	152
Currency in Circulation (millions)[3]	$30,621	$30,552	$30,055
Dept. Store Sales (changes from year ago)[3]	+8%	+6%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,107	$17,526	$22,021
Federal Gross Debt (billions)	$280,008	$280,315	$278,799
Bond Volume, NYSE (millions)	$15,910	$24,861	$18,163
Stocks Sales, NYSE (thousands of shares)	8,666	12,213	10,454
Loans and Investments (billions)[4]	$86,102	$84,616	$84,722
U. S. Govt. Obligations Held (billions)[4]	$31,419	$30,282	$37,364
PRICES			
STEEL's Finished Steel Price Index[5]	208.90	208.90	194.53
STEEL's Nonferrous Metal Price Index[6]	263.9	264.1	218.6
All Commodities[7]	111.2	111.2	109.8
Commodities Other Than Farm & Foods[7]	118.6	118.7	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278; 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

THE BUSINESS TREND





	1955	1954	1953
Jan.	5 220	4.057	5.752
Feb.	6.709	4.272	6.521
Mar.	6.161	5.093	8.255
Apr.	5.447	5.319	7.758
May	6.411	5.007	4.629
June	7.419	5.176	5.690
July	5.834	4.733	5.533
Aug.	7,022	6.706	4.846
Sept.		5.050	4.845
Oct.		3.828	5.097
Nov.		5.224	4.634
Dec.		4,787	4.645
Total		59,252	68,245

Hydraulic Institute

	Shipments—Units 1955	1954	1953
Jan.	210.900	164.400	189 900
Feb.	228.400	175 000	194.200
Mar.	263.100	187.800	207.400
Apr.	215.200	200.800	209.500
May	229.400	195.600	183.300
June	227.100	206 700	181.200
July	219.300	190.300	178.900
Aug.	271.000*	207.100	168.100
Sept.		205 500	179.000
Oct.		202.000	194.300
Nov.		179.100	155.000
Dec.		166.800	141.900
Total		2,281,100	2,182,700

Gas Appliance Mfrs. Assn.
*Preliminary

Charts copyrighted, 1955, STEEL

mary metals, machinery and transportation equipment—will account for more than half the rise. Pre-Christmas hiring in trade and services will more than offset light layoffs in utilities, communications, transportation and government. Jobseekers are fewest since October, 1953.

Material Movers Optimistic . . .

The Material Handling Institute reports optimism about fourth quarter bookings which promise to surpass those of 1953, the industry's peak year.

Bookings dipped in August, but were still 6.2 per cent ahead of that month in 1954. The institute interprets those bookings as indicating, "continuing stability that represents additional investment by industry in capital goods."

The August bookings were, in fact, higher than all but three months of last year. And, the institute explains: "While materials handling equipment purchases are not considered seasonal, usually some decrease is expected."

The nation's railroads continue their equipment purchases, though the pace has slipped sharply from the midsummer buying splurge.

Class I railroads had 816 new locomotives on order as of Oct. 1. A year ago only 115 were on the books.

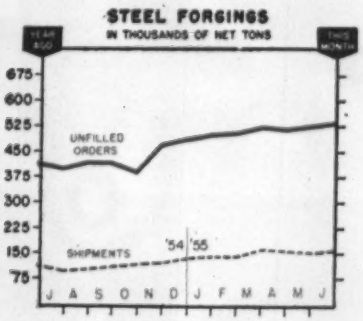
So far this year 786 units have been put in service. That's behind the 953 installed in the same time last year, but 1955 is catching up. Last month, 85 units took to the rails, compared with 75 a year earlier.

Freight Car Ordering Slips . . .

September freight car orders took a nose dive from the extraordinarily high level of the preceding three months but still managed to stay ahead of the like month of last year. Orders totaled 3228, compared with the 1954 mark of 2396.

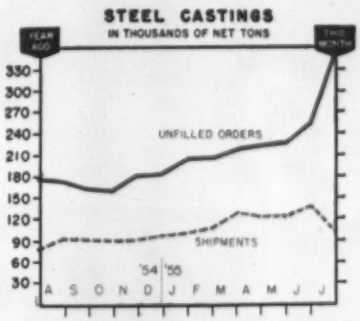
The slide isn't surprising. The roads put 44,777 cars on the books in the previous three months: June, 13,365; July, 18,007; August, 13,405. Just those three months saw more orders placed than in any of the three full years: 1954, 1953, 1952.

Even with the dip, orders last month continued to outpace deliveries. So backlogs pushed up to 52,913, compared with 52,803 on Sept. 1 and only 11,993 a year earlier.



	Shipments		Unfilled Orders	
	1955	1954	1955	1954
Jan.	136	139	488	638
Feb.	135	127	492	539
Mar.	154	130	507	487
Apr.	150	116	499	460
May	117	107	509	431
June	155	113	520	409
July	...	97	...	395
Aug.	...	102	...	410
Sept.	...	109	...	409
Oct.	...	113	...	382
Nov.	...	120	...	461
Dec.	...	129	...	473

U. S. Bureau of the Census. Data based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more



	Shipments		Unfilled Orders*	
	1955	1954	1955	1954
Jan.	98.2	122.8	201.8	251.8
Feb.	106.4	116.5	202.3	234.6
Mar.	127.5	122.3	215.1	214.3
Apr.	120.1	105.8	221.3	197.9
May	122.5	91.6	225.3	182.5
June	133.9	100.0	251.4	169.6
July	97.8	75.8	354.6	170.6
Aug.	..	....	89.6	....	168.3
Sept.	..	....	88.4	....	158.8
Oct.	...	....	87.1	....	154.1
Nov.	...	....	87.7	....	175.7
Dec.	...	....	93.5	....	179.1
Total	..	....	1,184.1		

*For sale. U. S. Bureau of the Census

Competition Makers . . .

More new business corporations have been formed in the first nine months of this year than in any similar period in history. Dun & Bradstreet Inc. reports 107,257 new companies, up 25 per cent from last year's pace.

September charterings hit 11,024, largest total ever recorded for the month and up almost 20 per cent over last year's figure.

Business failures, on the other hand, declined per the usual seasonal trend. The 822 in September were lowest in a year, but still more numerous than in any September since 1940.

With the Record Breakers . . .

Contract awards for heavy construction continue their October flash with $420 million reported in the latest week by *Engineering News-Record*.

Industrial and commercial building and mass housing continue to lead the climb. But public construction added strongly to the latest week's leap. Federal awards to date this year are 35 per cent greater than last; state and municipal building is at a record high.

Passenger car output spurts to about 140,000 as all producers but Studebaker swing to postchange-over action. Production is highest since early August. Ford is running full tilt. Chevrolet, off to a later start, is losing no time working up to top speed.

Trends Fore and Aft . . .

Westinghouse Electronic Tube Division reports bookings in the first nine months up 30 per cent over the like 1954 period. Says Louis Martin, division general sales manager: "We have every reason to believe that the upward trend will continue through December to make 1955 a banner year for the division" . . . Electro Refractories & Abrasives Corp. shows a 50-percent upsurge in refractory sales in the first three quarters. R. Clyde Wolfgong, vice president of sales, attributes rocketing volume to increased business activity, plus development of more efficient refractory products . . . Commerce department figures September retail sales at $15.9 billion, up 11 per cent over that month of 1954 . . . TV, radios and automatic dryers are the best selling appliances, notes Dun & Bradstreet Inc. On the wholesale level, automatic laundry appliances stand out.

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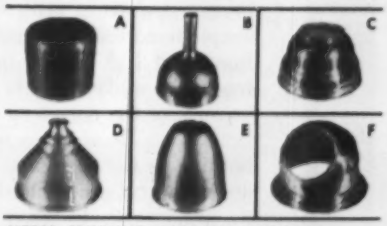
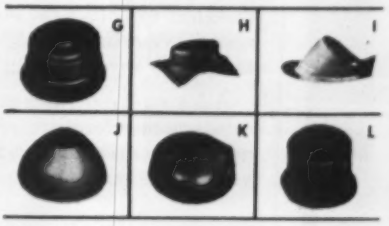


METAL SPINNING AND SPINFORMING:
Typical items: A—Aircraft detail; B—Handle lamp; C—Lamp shade; D—Lamp base; E—Electronic cover; F—Compass cover.



HYDROFORMING:
Typical items: G—Appliance cover; H—Jet engine detail; I—Aircraft detail; J—Jet engine detail; K—Cleaner cover; L—Motor housing.

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WILLIAM J. PIERRE
. . . director of purchases at Kaydon Eng.

William J. Pierre joined **Kaydon Engineering Corp.**, Muskegon, Mich., as director of purchases. He was with Servel Inc. where he supervised purchasing functions as administrative assistant to the vice president of purchasing. **Harold R. Marquand** was made director of industrial relations and **Harry C. Waters** assistant treasurer.

D. B. Benedict was elected a vice president of **Carbide & Carbon Chemicals Co.**, division of Union Carbide & Carbon Corp., New York. He is responsible for long range planning in certain research and development activities, as well as programs on synthetic fibers. He was works manager of the division.

George D. Butler was appointed director of sales, **Norden-Ketay Corp.**, New York. He was vice president-sales of Warren Electronics Inc.

Penn Metal Co. Inc., New York, appointed **Maurice K. Brown** assistant general sales manager.

William J. Fath was made production control manager at **Hydraulic Press Mfg. Co.**, Mt. Gilead, O. He was production manager and plant manager for National Farm Machinery; before that, production control manager with Fruehauf Trailer Co.

SAMUEL P. FELIX
. . . De Laval Turbine Pacific v. p.

Samuel P. Felix was named vice president of **De Laval Turbine Pacific Co.**, subsidiary of De Laval Steam Turbine Co. In addition to his new post, he continues to serve as general manager of the company, which recently began operations in a new sales and service center in Millbrae, Calif.

Aluminum Co. of America, Pittsburgh, appointed **William R. Butler** manager of diecasting sales and **Charles Braglio** manager of jobbing sales. **Warren Van R. Gilbert** was made assistant manager of forging sales, Vernon, Calif., works. **John F. Faulkner** heads the new aircraft-airframes section of the Cleveland sales development division.

George W. Crawford was made assistant sales manager, **Punch Products Corp.**, Niagara Falls, N. Y. He was customer service manager for Wales-Strippit Corp.

Roger U. Winston was elected president and chairman of **Western Steel Co.**, San Diego, Calif.

John D. Knox joined **Sintercast Corp. of America**, Yonkers, N. Y., as manager of production. He was with Firth Sterling Inc. for 15 years. **John B. Adamec** was appointed chief metallurgical engineer, responsible for process and quality control in the production department.

HAROLD L. DANZIGER
. . . gen. sales mgr. of Hollingshead

Harold L. Danziger was promoted to general sales manager, **R. M. Hollingshead Corp.**, Camden, N. J. In addition to sales, he will direct advertising and market research departments. He previously was group manager in charge of automotive, special brands and Universal divisions.

Joseph E. Mihm was made assistant vice president of **Walworth Co.** He has charge of the West Coast operations with headquarters in San Francisco.

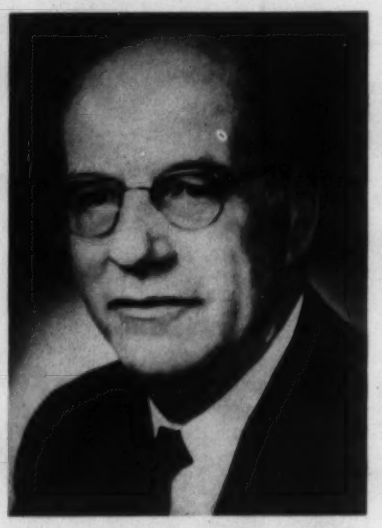
Lester W. Graaskamp, vice president in the executive department and a director of **American Can Co.**, was named vice president in charge of the central division at Chicago. He succeeds the late **Michael P. Cortilet.**

John D. Kuechle was made works manager of **Louis Allis Co.**, Milwaukee. He was general superintendent in the manufacturing section.

Max Ten Hagen was named manager of manufacturing at **Solar Aircraft Co.'s** Des Moines plant. **Earl Needham**, former purchasing agent, assumes Mr. Ten Hagen's former duties as materiel division manager. **Herbert Lubke** was made purchasing agent and **Richard Bartel** assistant purchasing agent.

Charles E. Heilig Jr. was made

J. J. PLUMB



MILTON C. TON

. . . purchasing agents of Michigan Tool divisions

sales manager of the Pop Rivet Division of **United Shoe Machinery Corp.**, Boston.

J. J. Plumb was made purchasing agent and **Duncan E. Vertrees Jr.** service manager for the machine and tool division of **Michigan Tool Co.**, Detroit. **Milton C. Ton** was made purchasing agent for the cone-drive division, Traverse City, Mich.

William A. Roth, vice president and former assistant general manager, **Cleveland Pneumatic Tool Co.**, Cleveland, was named general manager to succeed **Vern R. Drum**, retired. Before joining the company in 1954 as director of manufacturing, Mr. Roth was with McDonnell Aircraft Co., serving as vice president and factory manager.

Servo Corp. of America, New Hyde Park, Long Island, N. Y., promoted **A. Eric Theis** to vice president-manufacturing; **Charles F. Healey** to vice president-administration; and **H. Gordon Hawthorne** to treasurer.

F. P. Spruance Jr. was elected a vice president of **American Chemical Paint Co.**, Ambler, Pa., and was made sales manager of its metalworking chemicals division. He succeeds **F. P. Spruance Sr.** who continues with the firm as a director and in a part time advisory and consulting capacity.

T. P. Stanton was made midwestern district sales manager of **Basic Refractories Inc.**, with headquarters in Gary, Ind.

Roy E. Carter was promoted to superintendent of maintenance at **Green River Steel Corp.**, Owensboro, Ky.

Kenneth M. Bartlett was made executive vice president of **Horizons Inc.**, Cleveland.

John H. Harris was elected vice president-planning at **Brush Electronics Co.**, Cleveland, division of Clevite Corp. He was vice president-general works manager. **Wallace T. Gray** becomes general works manager. He was works manager for Leece-Neville Co.

Albert H. Clarke succeeds **Carl H. Bissell** as vice president-engineering at **Crouse-Hinds Co.**, Syracuse, N. Y. Mr. Bissell retires Nov. 1. Mr. Clarke was a commercial vice president.

Frank McLain was named assistant sales manager for **Sharon Steel Corp.'s** Detroit tube and steel division. He is replaced as sales representative by **David Campbell Jr.**

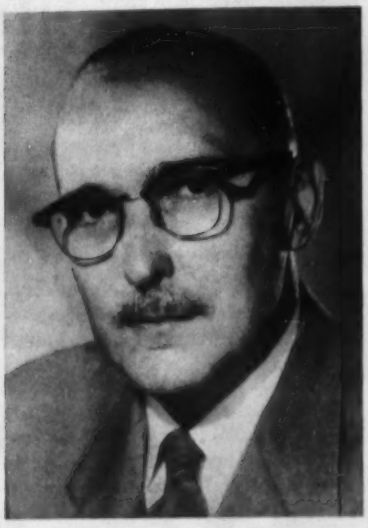
Robert L. Lewis replaces **L. E. McHaney**, resigned, as director of contracts for **Temco Aircraft Corp.**, Dallas.

George A. Jaggers was named president of **Fort Worth Steel & Machinery Co.**, Ft. Worth, Tex., to succeed **J. D. Brance**, now chairman of the board. Their election followed the company's expansion with acquisition of Monarch Mfg. Co. and its division, Armoloy Co., both of Fort Worth. Mr. Jaggers was president of both Monarch and Armoloy. **Walter Connell** was named to the new post of midwestern regional manager with headquarters in Chicago.

Dr. Jack S. Newcomer was made a research supervisor at the Niagara Falls, N. Y., plant of **Hooker Electrochemical Co.** He succeeds **Aylmer Maude**, retired.

John A. Petroskas was appointed chief metallurgist of **Phoenix Iron**

JOHN H. HARRIS



WALLACE T. GRAY

. . . executive changes at Brush Electronics Co.

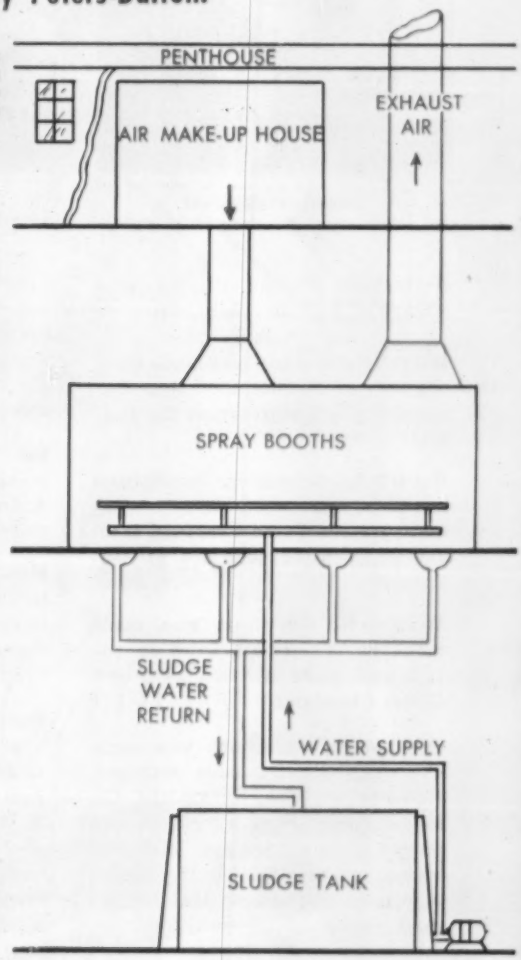
Paint Processing Equipment by Peters-Dalton –part of the CHRYSLER *Forward* Look

Multi-million dollar expansion program at Chrysler-Jefferson Plant, Detroit, includes the installation of special high production paint process equipment—designed, engineered, fabricated and erected by Peters-Dalton.

Roof level includes exhaust fans and ducts along with fresh air make-up house.

Second floor level contains paint finishing production lines and spray booths.

First floor level contains fresh water pumping system and sludge tanks for paint separation.



To fill an important role in the huge expansion program undertaken at the Chrysler-Detroit Plant, the requirements for a vast paint processing equipment installation were met by Peters-Dalton. This is another case of an outstanding challenge solved by P-D engineers. The equipment had to be designed to fit within the structure being built by Chrysler and to conform to layouts made by their plant engineers. It operates on three levels and provides the special services so necessary for maintaining its part in the highly accelerated production program at Chrysler.

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ROBERT HARTENSTEIN
. . . Mannesmann-Meer Eng. chief engineer

PAUL N. STANTON
. . . Lapointe Machine Tool asst. sales mgr.

JUDSON B. SHAFER
. . . Fasteners Inc. president-gen. mgr.

& Steel Co., Phoenixville, Pa., subsidiary of Barium Steel Corp.

Robert Hartenstein was made chief engineer at **Mannesmann-Meer Engineering & Construction Co. Inc.**, Easton, Pa.

Robert L. Schroeder, installation engineer, was made aircraft sales manager for **Pesco Products Division** of Borg-Warner Corp. at Bedford, O.

Donald R. Goetchius was made manager of ceramic sales in the frit and glaze division of **Ferro Corp.**, Cleveland.

William F. McCormick was made Cleveland district sales manager, **Reliance Division**, Eaton Mfg. Co. He succeeds **John Kerr** who was moved to the Saginaw, Mich., division of the company. **Joseph Harrison** will assist Mr. McCormick.

Walter J. Walsh was made Ohio sales representative for **American Agile Corp.**, Cleveland.

Lapointe Machine Tool Co., Hudson, Mass., appointed **Paul N. Stanton** assistant sales manager. He was manager of sales and programming for Cambridge Corp., subsidiary of Carrier Corp.

Del F. Kahan was named vice president and chief engineer of **Autron Engineering Inc.**, Los Angeles.

Max C. Scheble was made assistant to the general manager of operations, **Columbia-Geneva Steel Division**, U. S. Steel Corp. He has headquarters in San Francisco.

Robert F. Duemler, can division vice president-sales, was promoted to director of sales, **Crown Cork & Seal Co.**, Baltimore. He succeeds **E. J. Costa**, retired. Mr. Duemler continues temporarily as can division sales manager. **W. L. Lohrfinck** fills the new post of general sales manager.

E. S. O'Connor was made operations manager, marine division, **Fageol Products Co.**, Kent, O.

Judson B. Shafer was elected president and general manager, **Fasteners Inc.**, subsidiary of Phillips Screw Co., New York. He was executive vice president. **C. M. Cambern**, former president, is now chairman of the board, and continues as president-general manager of the parent company. Mr. Shafer retains his position as executive vice president and director of the parent company.

W. Lyle Sturtevant was made manager of the Kansas City, Mo., district sales office of **Kaiser Aluminum & Chemical Sales Inc.**

Samuel M. Langston Co., Camden, N. J., elected **Louis J. Baudis** vice president in charge of engineering and manufacturing. He was a director and manufacturing vice president of Bullard Co.

Donald J. Shaughnessy and **Daniel Neuman** were named assistant managers-production planning at **Pittsburgh Steel Co.**, Pittsburgh. **John L. Jones** was made staff assistant in the division.

OBITUARIES . . .

Niels P. Lunn, 57, purchasing agent of **Fansteel Metallurgical Corp.**, North Chicago, Ill., died Oct. 15.

Charles Shipway Jr., 45, president, **Art Wire & Iron Co. Ltd.**, Toronto, Ont., died Oct. 18.

Carl E. Paulsen, 57, a consultant and former vice president of **Detroit Broach Co.**, Detroit, died Oct. 9. He was one of the organizers of the firm.

A. P. Montague Jr., 45, partner in the Lynchburg, Va., steel fabricating firm of **Montague-Betts Co.**, died Oct. 11.

James Currie, 64, manager of plant facilities of **Alco Products Inc.**, Schenectady, N. Y., died Oct. 13.

Glen W. Cole, 60, vice chairman of the board of directors and former president of **Corning Glass Works**, Corning, N. Y., died Oct. 18.

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Reynolds Expands

Subsidiary is formed to produce aluminum sheet, foil and other products in Canada

REYNOLDS METALS Co., Louisville, is extending its fabricating operations into Canada. This follows its recent announcement of plans for a $230-million expansion that will increase its primary aluminum production from 829 million to 1.1 billion lb a year.

Reynolds International Inc., the firm's subsidiary which manages foreign manufacturing operations, will acquire control of the aluminum sheet and foil plant at Cap de la Madeleine, Que. The plant, formerly operated by Aluminum Rolling Mills Ltd., will produce aluminum sheet, coils, circles for pots and pans, foil, roofing, insulation and converted foil for packaging and displays.

To Boost Output—Reynolds Aluminum Co. of Canada Ltd. will be formed to operate the plant, which will be enlarged. Officers will include: J. Edouard Simard, chairman of the board; J. Louis Reynolds, president; and C. A. Wishart, executive vice president.

Commenting on the new plant, Mr. Reynolds said:

"The company is going into Canada because there is a great opportunity for development there. Reynolds has a market in Canada for many of its products, and this market should be expanded. Many Reynolds customers have branch plants in Canada, and we will be able to give them better service from the plant in Canada."

Reynolds also is erecting a building on the outskirts of Richmond in Henrico county, Virgina, to house its executive offices. Cost of the project, including property and landscaping, will be about $10 million.

Republic To Build Warehouse

Republic Steel Corp. will build a 75,000-sq-ft warehouse on Sugaw Creek road near Tryon street, Charlotte, N. C. Stocks will include a line of the Truscon Steel Division's standard building products; the Berger Division's lockers, shelving and office furniture; and the Steel & Tubes Division's conduit. A complete line of stainless steel will be maintained by Vance Iron & Steel Co., Chattanooga, a wholly owned subsidiary warehouse of Republic.

Machine Dwarfs Workmen

SWIFT would have new tales to tell if he could send Gulliver on a trip to Lockheed Aircraft Corp.'s plant in California. Men are dwarfed by a $100,000 device used in building airplane wings—so large that workmen on it communicate by intercom. But it is so precise that watchmakers' tools were used in its construction.

Wings produced on it will have an area of 1850 sq ft and a length of 150 ft, largest of any transport.

Aetna-Standard Expands

Aetna - Standard Engineering Co., Pittsburgh, has completed its fourth major expansion in recent years at its Ellwood City, Pa., plant. The newest project adds about 40 per cent to production capacity—increases are concentrated on machining, welding and assembly facilities. Costing between $2 million and $3 million, the expansion includes installation of many new machine tools, a new power plant and control equipment.

Aetna-Standard builds machinery for the steel, copper, brass, aluminum, rubber and plastics industries.

The firm has been awarded a contract by Youngstown Sheet & Tube Co. to design, build and install a seamless tube mill at the Indiana Harbor Works, East Chicago, Ind. It will produce tubes 4½ to 9⅝-in. in diameter.

Aetna also has contracts to furnish a continuous annealing line for Dominion Foundries & Steel Co., Hamilton, Ont.; a tube sizing mill for Timken Roller Bearing Co., Canton, O.; a piercing mill and drawbench equipment for copper tubing for American Brass Co.'s Los Angeles plant.

Adsco Buys Howard Iron Firm

Howard Iron Works, Buffalo, has been purchased by a group associated with Adsco Industries Inc., North Tonawanda, N. Y. The Howard Iron plant will be sold to Wiesner-Rapp Co. Inc. which makes machine tools and machinery in several Buffalo area plants. The Howard Iron operation is being moved into one of Adsco's plants.

Opens Technical Service Unit

The Texas Co., New York, opened a technical service headquarters under the direction of J. C. Van Gundy in building No. 1, Gateway Center, Pittsburgh. Its services will be for the iron, steel and aluminum industries in the area.

Technion Tool & Mfg. Renamed

Technion Tool & Mfg. Corp., New York, changed its name to Technion Design & Mfg. Co. Inc. Herbert Schwartz is president and sales manager; Charles Saso, vice president and plant manager.

Budd Acquires Equipment Line

The Budd Co., Philadelphia, builder of automotive bodies and wheels, stainless steel railway passenger cars and jet engine components, will manufacture gamma radiography equipment and sources previously produced by Gamma Corp., Mansfield, Mass.

Liquid Carbonic Sells Line

The bottling machinery line of Liquid Carbonic Corp., Chicago, is being sold to three leading bottling equipment manufacturers. Three separate transactions include the sale of inventories, tooling, designs and licenses to sell under certain patents and trademarks. Purchasers: George J. Meyer Mfg. Co., Milwaukee, assets relating to the low-pressure filler, Monarch beer filler, crowner, half-depth uncaser and the O & J labeler; Barry - Wehmiller Machinery Co., St. Louis, the Superkleen bottle washer, Universal bottle washer, Waterfall pasteurizer, conveyor and full-depth uncaser;

Crown Cork & Seal Co. Inc., Baltimore, the Red Diamond filler, water cooler, carbonator and beverage mixer. This move practically completes the sale of all product lines of Liquid Carbonic's Durable Goods Division.

Lamson & Sessions To Build

Lamson & Sessions Co., Cleveland, will construct a plant in Brooklyn, O., a suburb of Cleveland, and a 110,000-sq-ft plant in Bedford Park (Chicago), Ill.

American Bosch Corp. Expands

Capacity of the Columbus, Miss., plant of American Bosch Corp. will be doubled by a $1.5-million expansion. This will give the plant, which turns out electronic equipment for the armed forces and electrical equipment for the automotive industry, a floor space of 200,000 sq ft.

Buys Oil Well Equipment Firm

U. S. Industries Inc., New York, purchased Garrett Oil Tools Inc., Longview, Tex., maker of oil well equipment, including gas lift valves, free pistons, relief valves and tank switching systems.

U. S. Steel Opens Warehouse

United States Steel Supply Division, United States Steel Corp., opened a steel warehouse on Center street, Southington, Conn. Selected stocks of steel, tailored to the requirements of the area, will be carried. Customers will be able to draw on the resources of the Newark, N. J., warehouse as well as the division's 15 other plants.

Hoffman Transfers Lines

U. S. Hoffman Machinery Corp.'s Industrial Filtration Division, New York, transferred the manufacture and sales of its by-pass, full-flow and portable cartridge filters, oil conditioners, vaporizers and preheaters to its affiliate, Hoffman-Allen Corp., Springfield, Mo. U. S. Hoffman will continue to manufacture flotation systems, magnetic separators and other products for the metalworking field at its Thompson road plant in Syracuse, N. Y. Hoffman-Allen Corp. through its affiliate, Filter & Injector Co., Springfield, will continue to make and furnish filter cartridges and supplies for Hoffman and similar filters.

Trick Bending

Five different heats were given this 30-ft section of fusion welded chrome-moly pipe to obtain a 90° bend on an offset of 24° 18' on an 11-ft radius. This pipe has a 27½-in. OD with a 1½-in. wall thickness. To compensate for thinning of walls during bends, Blaw-Know fabricated it 10 per cent thicker than specifications required

Plans Sulphuric Acid Plant

Arthur G. McKee & Co. of Canada Ltd., Toronto, Ont., will build a sulphuric acid plant in the Blind river area for Noranda Mines Ltd. It will have a productive capacity of 500 tons per day. Noranda will use iron pyrite as the basic material in the production of the acid.

REPRESENTATIVES

Parker Appliance Co., Cleveland, franchised Dudley C. Jackson Inc., Chicago, as a distributor of its fittings for hydraulic hose. For technical assistance, the new distributor will have the services of E. G. Durfee, Parker district manager, with newly opened offices at 9106 Ogden Ave., Brookfield, Ill.

Morley Bros. of Royal Oak, Mich., has been franchised as the Detroit area distributor for **Avco Mfg. Corp.'s American Kitchens Division**, Connersville, Ind. The Morley home office is in Saginaw, Mich.

Wallace Supplies Mfg. Co., Chicago, appointed Harrison Engineering Services, Washington, representative for its tube bending machines and abrasive cutoff units for East Coast aircraft manufacturers.

L. B. Foster Co., Pittsburgh, has enlarged its Atlanta office staff with the addition of Erskine Fraser as sales representative. He will handle sales of Foster steel sheet piling, pipe piling, steel pipe, rail and track accessories in the Southeast.

Metalphoto Corp., Cleveland, appointed W. Schiller & Co., St. Louis, a distributor for its presensitized aluminum plates for photographic reproduction of name plates, wiring diagrams, instruction panels and similar products.

NEW ADDRESSES

Macwhyte Co., Kenosha, Wis., wire rope manufacturer, moved its San Francisco warehouse to 188 King St. The new building houses facilities for handling, cutting and shipping wire rope.

Joy Mfg. Co., Pittsburgh, machinery manufacturer, moved its Detroit office to 17615 W. McNichols Rd.

ASSOCIATIONS

Donald H. Cornish has been named to the newly created position of executive director of the **Cleveland Engineering Society**, Cleveland. Warren H. Chase, vice president, Ohio Bell Telephone Co., is president of the group.

J. L. Cranwell, vice president, Pennsylvania Railroad, was elected president of **American Standards Association**, New York.

Ostuco Welded Tubing

. . . Specified by men with responsibility

OSTUCO Welded Tubing **offers design engineers unlimited latitude to create a variety of original but practical product designs.**

Sales Managers can meet. . . and beat **the competition with products incorporating OSTUCO Welded Tubing.**

Cost Control is easier **with OSTUCO Welded Tubing. Low initial cost and less time-consuming processing mean *important* savings.**

Extra strength, **less weight, and uniformity of OSTUCO tube walls insures top quality finished products time after time. No rejects here.**

Production runs smoother. . . faster **with OSTUCO Welded Tubing components. Assembly time is reduced, expensive operations eliminated. Production schedules are on *time*.**

OSTUCO's single-source **service design (manufacturing and fabricating under one roof) means error-free handling of *every* order—large or small. Purchasing can relax . . . less follow-up necessary with OSTUCO.**

OSTUCO **OSTUCO TUBING**

SEAMLESS AND ELECTRIC WELDED STEEL TUBING
—Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company • **SHELBY, OHIO**
Birthplace of the Seamless Steel Tube Industry in America

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CANADA, RAILWAY & POWER ENGR. CORP., LTD.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
117 Liberty Street, New York 6, New York

STEEL

October 31, 1955

Technical Outlook

MORE VACUUM—Newest process for high temperature alloys is consumable electrode melting under vacuum. Allegheny Ludlum Steel Corp. is set up to turn out 250,000 lb per month, can make 1 million lb per month on short notice. Advantages of the vacuum material over air melted: 1. A higher degree of cleanliness because nonmetallic inclusions and gases are removed. 2. Homogeneity is better due to freedom from segregation. 3. Improved workability and ingot soundness give user increased yield of product. 4. Mechanical properties are better. Allegheny Ludlum is thinking in terms of vacuum melting ingots up to 4000 lb.

HIGH TEMPERATURE ALLOY—A chromium-iron-base alloy with good high temperature strength and resistance to thermal shock was disclosed by Battelle metallurgists at ASM's Chromium Symposium in Philadelphia. Ingots up to 12 lb have been forged. The alloy is malleable at room temperature, but it does not have measurable ductility. With these properties, however, it's useful in jet engines.

MICROFLAT—Flat wire as small as 0.003 x 0.0007 in. with a mirror finish, rounded edges and a thickness tolerance of ±0.00001 in. is being diamond drawn by the allied products division of Hamilton Watch Co. The company will make the wire from your alloy.

ATOM DETECTIVE—Rust-Oleum Corp. wanted to prove that its protective coating would penetrate rust. Battelle Memorial Institute technologists made a constituent of the organic coating radioactive, then traced it to the base metal. The point was proved.

PURITY—Permanent mold casting stands to benefit from high purity aluminum alloys 355 and 356, says Kaiser Aluminum & Chemical Corp. About 10 per cent greater ultimate strength than the standard alloys give is possible through heat treatment of the purer metal, now available in ingot form. At a 3 per cent per pound cost increase, net cost savings should come from lighter castings made possible by higher strength.

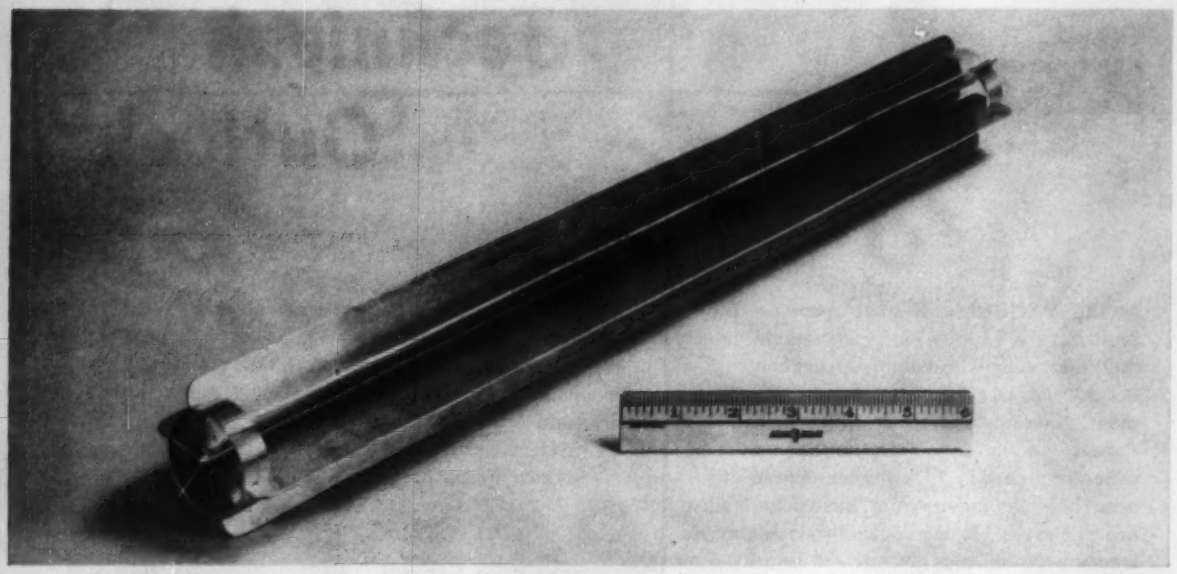
2500-TON TESTER—What is said to be the largest universal testing machine in the world has been dedicated at Fritz Engineering Laboratory, Lehigh University. It can apply tension and compression loads up to 5 million lb. Structures 40 ft high can be tested in tension above the sensitive crosshead or in compression below the crosshead. The base structure will handle test specimens 100 ft long, 40 ft high and nearly 10 ft wide.

IT'S HOT—Aircraft designed to fly at three times the speed of sound probably will use pneumatic control devices. Few electronic components can withstand the 650 to 1000° F the craft will encounter. Some pneumatic controls now are being used on jet engines and many others are in the development stage.

CRACKING ENDED—When solid metal electrical terminals expanded and cracked the ceramic parts in which they were sealed, Ceramoseal Co. solved the problem by substituting thin-walled tubular terminals with a coefficient of expansion close to that of the ceramic.

FAST ANALYSIS—Ford's Dearborn (Mich.) iron foundry is using a "Spectromet" to make speedy analyses of iron melts. Samples take only 1 minute to prepare, 40 seconds to analyze. Analysis of up to eight elements shows directly on calibrated dials. The machine is mounted directly on the foundry floor.

Metalworking Outlook—p. 29 *Market Outlook—p. 87*



Atoms Mean Business

By DR. ALLEN G. GRAY
Technical Editor

THE DEVICE above is an atomic fuel element—three aluminum covered plates bent at an angle. Each fin contains a layer of uranium-aluminum mix inside the aluminum covering.

When a number of these elements are placed in a reactor, atomic fission takes place. The intense heat generated is converted into steam, then electric power.

Announced a few weeks ago by Sylvania Electric Products Inc., this is one of many new products that metalworking plants will be turning out for atomic customers.

Prospects—By 1963, the manufacture of components for reactor plants may be a $700-million-plus-a-year business, predicts the Atomic Industrial Forum, a nonprofit organization of top businessmen headed by Detroit Edison Co.'s president, Walker L. Cisler.

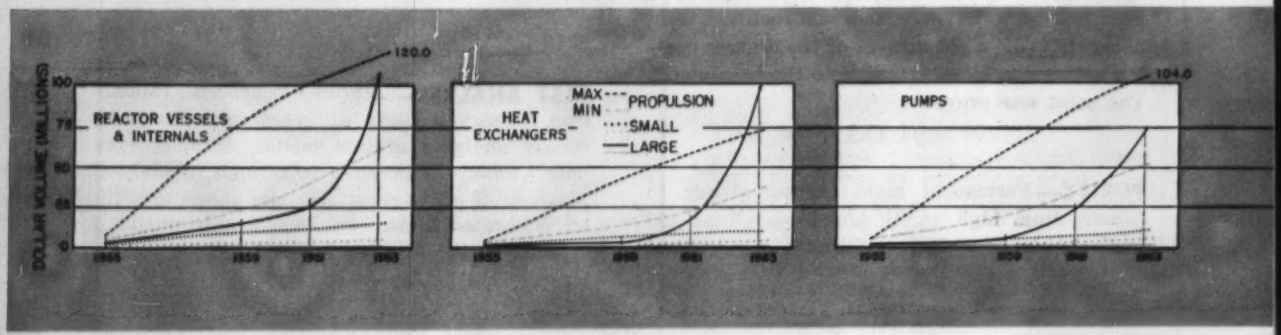
"After 1960, we have only 15 years in which to build something like $8 billion worth of nuclear power plants to produce 45 million kilowatts of electric power," says Clarence E. Larson, Union Carbide & Carbon Corp.'s vice president and former director of Oak Ridge National Laboratory.

Of the several nuclear components analyzed in the Atomic Industrial Forum survey, the ones requiring the greatest amount of industrial development are: Fuel elements, pumps, controls, reactor vessels, instrumentation and heat exchangers. The listing is in order of importance.

Heat Source—Fabrication of nuclear fuel elements alone could amount to $200 million in annual business by 1965.

To compete, firms that want to make this kind of product must develop new techniques in welding, melting, rolling, annealing, extrusion, etc.

They will come up against many difficult metallurgical problems. Take cladding material—the con-



tainer for the fuel element. It must be efficient in heat transfer and also give a corrosion resistant seal against the cooling medium. Exceptionally good bonds are a must because stresses caused by the intense fission heat can separate a cladding from fuel element.

$ Values—Charts at the bottom of these pages give AIF estimates of the market range for reactor system equipment.

First, look at vessels and their components. The potential for all types of reactors is estimated at about $190 million by 1963.

Except for research reactors of the swimming pool type, all nuclear systems require a pressure vessel to hold the fuel core and coolant. Their construction is a custom fabrication job.

Stainless steels (such as types 347 or 305L, either solid or clad) are specified. Zirconium will be used where its nuclear properties are needed. Titanium is in the picture, too. Factors to be considered are not only the usual physical and thermal stresses but also highly corrosive conditions and radiation damage.

Case in Point—The vessel being fabricated to hold the reactor for this nation's first full-scale atomic power plant (Westinghouse is building it at Shippingport, Pa.) will have an over-all height of 33 ft. It is cylindrical, having an outside diameter of about 9 ft.

Its walls will be almost 9 in. thick—carbon steel plates and forgings with ¼-in. stainless steel cladding. Total weight: About a half million pounds.

More Talent—Vessels for high output reactors will contain many cooling tubes and a base for support of the hot core. Vessel diameters may range from 4 to 25 ft.

There are many fabrication jobs in this area to justify developing the know-how needed. Examples: Heavy metal thermal shields, special handling systems and tank structures to hold the entire nuclear portion of the power plant.

Translate — As of today, all atomic energy must be changed into heat to give useful power as steam, hot gas or electricity. This means heat exchangers are the heart of reactor systems.

One exception is the boiling water design where it is planned to generate steam for direct drive of a turbogenerator. (But more tests are needed to show that radiation contamination will not interfere with operation.)

Manufacturers of heat exchangers can use their know-how and equipment to get into the atomic end of the business. But they should expect to find technical demands more stringent.

Check These—Fabricators must know how to use highest quality materials and new metals. They must meet exceptional leak tightness and cleanliness specifications. Also needed: Ingenuity in devising simple tests and cheap inspection methods.

Reactors will use many different kinds of pumps. Nuclear engineers say they are a critical component because they may limit the design of the over-all plant, set a pattern for other components and cause tough maintenance problems.

New Types—The most unique pump requirements are for the main reactor coolant system. Electromagnetic pumps have been developed for liquid metal systems and canned rotor pumps are used (STEEL, Aug. 1955, p. 128).

But there's opportunity for pumpmakers to stick to more conventional designs and come up with less expensive models to meet the requirements—using perhaps titanium, zirconium or special coatings to cope with corrosion problems.

Valves—Reactor systems have exacting valve needs. Required are: 1. Leak tightness. 2. Corrosion resistance. 3. Fail-safe operation. 4. Remote maintenance.

The atomic market will need valves made of corrosion resistant alloys with ingenious seals to guarantee no leaks, and which will open or close on failure. Ways must be devised to remove valves and pipes from "hot" (radioactive) systems by remote control.

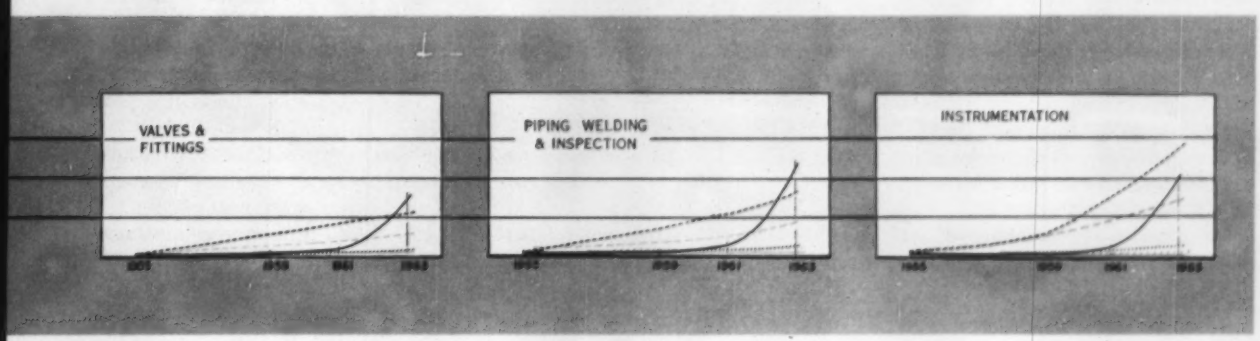
Problems—Almost any leakproof valve of the size needed in a central station atomic power plant is a development item now.

The problems of pumps and valves in liquid metal cooled systems are more difficult than those of their water counterparts. The electromagnetic pump handles liquid metals. Potential users say it's expensive, large, rather inefficient.

> Dr. Gray has worked on atomic projects and is a member of AEC's advisory committee on information for industry

Robot Welding—Fabrication of reactor piping systems calls for welding skills of the highest order. Once a system is put into operation and gets "hot," its maintenance may create a market for remote welding and cutting equipment.

The market for standard in-



struments will grow as industrial atomics develop, because much of reactor instrumentation will be standard.

Minimum — Emphasis will turn to instrument simplification to cut costs. Even so, there will be need for devices built around novel functions.

If a reactor is to turn out competitive power, the staff of physicists and technicians must be dropped from the operating crew. This means instruments and automatic controls that are reliable and simple.

The AEC and its contractors have developed many workable circuits. There are many avenues open for instrument makers to pick up the job and do the development needed.

Regulate — Aside from instruments, "control apparatus" will be used to control or stop the chain reaction. These mechanisms are needed for routine control and emergency shutdown.

They are mechanical and electrical devices for precise manipulation of rods. Design and fabrication of the rods, housings and activating systems to make them operate through the reactor vessel are part of the picture.

There's opportunity for the practical materials handling industry to bring its experience to bear on the complex problems of atomic power.

There's a great need to reduce fuel handling techniques and equipment to practical designs. Those close to the problem feel that it must be a part of reactor development involving unique materials handling methods.

FIND YOUR SPOT

How can your company share in the atom's vast industrial potential?

First, look at your products. Are they useful in some phase of the atomic industry—maybe as components in atomic equipment?

Perhaps atomics are a natural for your present line. Take the case of Babcock & Wilcox Co. whose business is the design and manufacture of complete steam generating units.

Join or Lose—"We tailor-make these units to all kinds of fuel." says John W. Landis of B & W's Atomic Energy Division. "Fissionable material is the newest type of fuel to become available. If it is capable of carrying a portion of the nation's power load, B & W must be prepared to supply the necessary equipment or lose a piece of its business.

"Much of this equipment is an outgrowth of what our company has been building for decades. The general techniques and know-how are residual with a large number of engineers and technicians in our shops and laboratories.

"We anticipate a role in the nuclear power business similar to what we now have in the conventional power business. We expect to make complete nuclear steam generators—starting with fuel elements on through to the turbine throttle."

Opportunity Here—But if there's no obvious tie in with your business, don't overlook the opportunity to diversify. You may come up with a fully engineered

Electronic Corp.

Radioisotopes . . . Can You Use Them?

WHETHER you should set up a program for the use of radioisotopes depends on the kind of business you're in and what you expect to get out of it.

First thing you should decide: Is the radioisotope to be used as a radiation source or a tracer? The problems are different.

No Gamble—In established applications — thickness gages, radiography, following flow in a pipe line, etc., you should get immediate benefit. Many companies have.

Results with tracers will come a little slower, perhaps not at all. You simply have a new research tool. The burden is on your technical people to use it.

If you need information on isotope procurement, write: Isotope Division, U. S. Atomic Energy Commission, Oak Ridge, Tenn.

Start—Suppose you decide to install a radioactive thickness gage in your production line. All you need is an AEC license to buy it. Generally, the cost of the radiomaterial is small ($10 to $75) compared to equipment cost.

The AEC licenses radioisotope users to keep tab on safety re-

atomic product that you can sell.

There are problems aplenty. Remember: The theoretical side of nuclear energy is far ahead of what's possible in the practical use of reactor materials. New ideas can be made to pay off just the same as they do in your regular business.

There is room for subcontractors, too. "The complex nature of such jobs means that any prime supplier will have to call upon subcontractors; and those selected will be the shops that have spent money or are willing to spend for special development," says William L. Borden of the Westinghouse Atomic Power Division.

Sign of the Times—A lot of companies, small and large, are taking steps to firm up their atomic possibilities. Seldom a week passes without an announcement that Company X is setting up a department or a subsidiary to probe its atomic business opportunities.

Here are just a few directions that typical companies are taking.

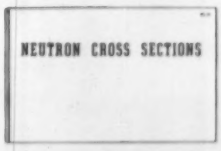
Westinghouse has established

Boning Up for Atomic Business

Many people in industry are attending AEC schools like the one above at Oak Ridge, Tenn.

A great deal of unclassified information is readily available. The books pictured on this page (3557 pages of information) can be purchased for about $20 from the AEC or the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Ask for: *Reactor Handbook, Vol. 1—Physics* (AECD-3645); *Reactor Handbook, Vol. 2—Engineering* (AECD-3646); *Reactor Handbook, Vol. 3—section 1, General Properties of Materials* (AECD-3647); *Chemical Processing and Equipment* (T1D 5276); *Research Reactors* (T1D 5275); and *Neutron Cross Sections* (*BNL* 325).



quirements. The red tape involved is that of answering a few questions on personnel and facilities that will be used in the program.

Less Responsibility — You may prefer to buy the gage from a manufacturer of instruments. Procurement will be simpler because the supplier usually retains ownership of the radioactive source and is responsible for the safety of the installation. Generally, he will instruct your operators.

For a sealed source in radiography, regulations are a little more strict. Reason: The source is portable. This means you need equipment for handling it remotely; instruments to measure radiation intensity; and a man in charge who understands the practical aspects of radiochemistry.

Handling devices can be simple. "They range all the way from a fish pole and string to elaborate mechanical contrivances made by a number of commercial suppliers," says Dr. Paul C. Aebersold, director of the AEC's isotope division.

Training — Cost of radiation instruments is reasonable. For training, the Oak Ridge Institute of Nuclear Studies offers a four-week course in isotope techniques. You need trained personnel for tracer work.

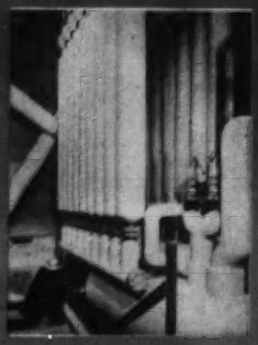
With all the isotope possibilities opening up you'll probably find it a good investment to assign a younger member of your technical staff to keep up with developments in this field and to take the specialized training that's offered.

Small Investment—Keeping informed is not expensive. A great deal of isotope information shows up regularly in technical journals and trade papers. There's always the possibility of a radiochemical technique or piece of equipment being developed that would fill a need in your plant.

The AEC will help in isotope procurement matters. It also maintains a technical development service where you can get information on health precautions, isotope availability and allocation procedures. The AEC publishes news bulletins, such as *Isotopics*, which is free to companies using isotopes. You can subscribe to it through the U. S. Government Printing office, Washington 25, D. C.

Another Angle—You may want to hire an isotope consultant or farm out a specific problem to a consulting firm. If results look good, you can move the work into your own plant. This avoids the expense of special facilities and training until you are sure of a benefit.

AEC says there are over 4000 applications of radioisotopes. More than 1300 industrial plants use them. If you aren't, now is a good time to take a second look.



Uses of Nuclear Power Equipment

1. Ship propulsion
2. Central station electric power plants
3. Industrial heat and process applications
4. Conversion of sea water to fresh water
5. Aircraft propulsion
6. Large central heating plants
7. Production of fissionable and fusionable materials
8. Package power plants for remote locations
9. Catalysis of chemical reactions
10. Making radioisotopes

an Atomic Equipment Department to make specialized mechanical components for nuclear plants.

American Machine & Foundry Co. has set up its subsidiary, AMF Atomics Inc., to become "the industrial department store for atomic energy equipment." It will specialize in quantity production of handling devices and control mechanisms for reactor systems. Master slave manipulators being turned out duplicate human wrist motions in hot cell operations.

General Electric converted a factory building into a $300,000 facility that will specialize in testing radioactive materials and high energy radiation equipment.

Pick a Horse—Eugene B. Hotchkiss, vice president, Vitro Corp., says: "We are convinced that reprocessing (fuel) is going to play a major role in economic atomic power . . . this problem will eventually be the responsibility of private industry. Objectives are twofold. 1. To find a promising avenue into which our research and engineering talent can be directed. 2. To evaluate opportunities for our company to carry out a reprocessing enterprise."

Several Directions — Thompson Products Inc., Cleveland, has a three-pronged program for the atomic department it laid out last month.

Vice President Arch T. Colwell says: "1. It will promote the sale of established company products modified for the special problems of atomic uses. 2. Long range, it will promote the sale of new products . . . mechanical and electrical components developed especially for the atomic age. 3. It will survey small companies active in the nuclear field with the thought of acquirement as a means of expanding into atomic energy products."

WHERE TO START

You don't need to hire a physicist to get started in the atomic energy business, says Edward R. Trapnell, former special assistant to the AEC's general manager. Here are his recommendations adapted from the *Atomic Energy Guidebook* recently published by the Atomic Energy Guideletter (Washington, D. C.) to give businessmen atomic information:

1. Select a young man (or more than one, depending on the size of your company); free him from all other assignments, and make it his responsibility to really learn the business. He should have a sound knowledge of your products and facilities.
2. See that he is well instructed in atomic energy, starting with fundamentals. A course at a university or at one of several AEC schools is a good beginning. He should visit AEC installations. As he studies and talks with people working in atomics, he will pick up a feeling for the scope of the field.
3. At this point you should be setting up management conferences with your atomic specialist. In these meetings analyze your product and facilities for application in the atomic energy field or discuss the production of a new item.
4. Keep the long-range view. Specify how much capital you can afford to invest. It may be one, five, even ten years before returns come in.

Learn, Too—Management should not depend entirely on its specialists. There is opportunity for executives to get a general education in atomic energy. Great technical knowledge isn't needed, but management should know what the problems are, how to evaluate opportunities and who's doing what.

One important source of information is the AEC depository in libraries around the country.

Classified data are available to any firm or person expressing interest. A special clearance will be needed which AEC will handle.

The government (under section 152 of the Atomic Energy Act of 1954) will waive rights to inventions and discoveries arising out of access to such information, except in case of secret permits where a nonexclusive royalty free license is granted.

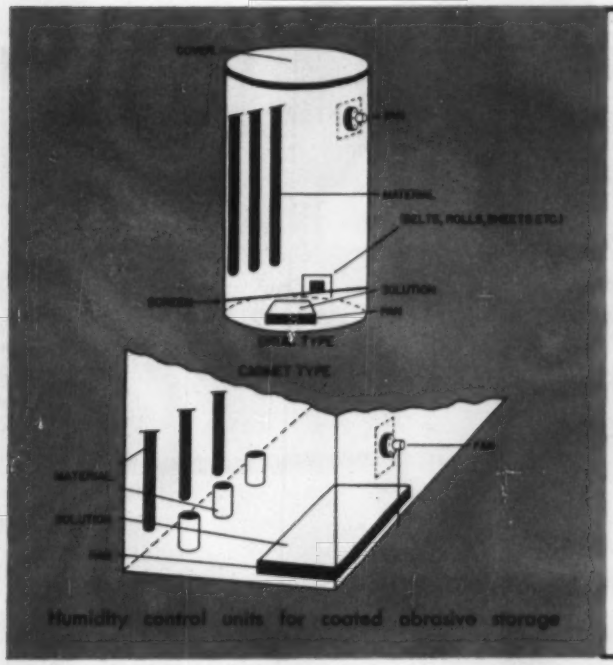
Since the new program was announced on Apr. 20, 350 applications for access permits have been received, reports AEC. From 50 to 70 firms a month are applying.

Study Here — Someone at the management level should become familiar with the Atomic Energy Act of 1954. Know what you can and can't do.

The act has a number of provisions that open the door to wider industrial participation. For example, industry gained the right to build, own, buy and sell atomic facilities during the past year.

To help free enterprise in atomics, the government has established rules and regulations that cover: Licensing of production and utilization facilities and their operators; charges for use of nuclear materials; prices for government purchase of plutonium and U-233; access to classified information needed by industry; and health and safety standards.

• *Extra copies of this article and Part II next week (metals for atomic applications) are available in quantities from one to three until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



Humidity control units for coated abrasive storage

Storage Recommendations

1. Store coated abrasives on pallets, in bins or on shelves, out of direct sunlight.
2. Leave coated abrasives in their original packages until ready for use. This modifies the effects of rapid changes in temperature and humidity.
3. Avoid use of storage areas subject to alternate hot and cold, wet and dry cycles.
4. Store coated abrasives away from heating equipment or steam lines.

Storage Is Key to Abrasive Efficiency

TO KEEP coated abrasives at top grinding and finishing efficiency, store them under proper temperature and humidity.

Studies by Minnesota Mining & Mfg. Co., St. Paul, advocate: 1. A constant temperature between 65 and 75°F. 2. A controlled relative humidity between 35 and 50 per cent. Glue bond papers have been stored for ten years at about 50 per cent humidity and 70°F without noticeable deterioration.

Effects—Generally, coated abrasive grinding and finishing efficiency increases as humidity decreases. However, when a coated abrasive product is allowed to dry out too much, brittleness, cupping and difficulties in handling nullify the advantages of increased cut.

Excessive humidity may cause a softening of the bond (particularly glue bonds). Mineral grains, when presented to the work, tend to push into the backing or lay over on their sides.

Storage—Good coated abrasive storage facilities range from a simple 55-gal drum or airtight metal cabinet to a walk-in unit.

In the drum or cabinet conditioner, place an enameled pan (about 9 x 18 x 2 in.) in the bottom of the container to hold a saturated solution of a humidity control chemical and water. A heavy screen over the pan will keep the coated abrasives from touching the solution. Necessary air circulation is provided by a small fan in the side of the drum or cabinet, near the top.

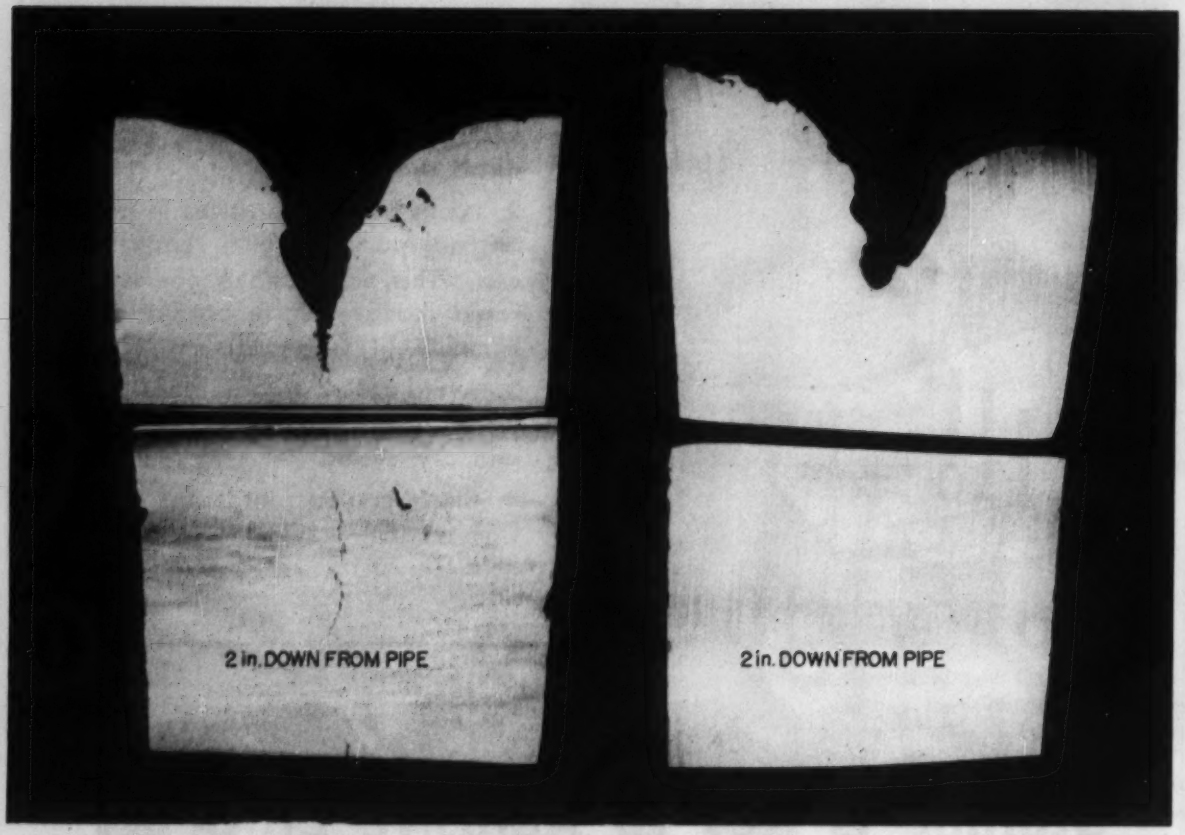
The cover of the container should fit tightly, but allow easy access. Place flat stock, such as sheets and discs, on the screen for conditioning; hang short belts on hooks attached to the inside of the container.

Anticipate Needs — It takes about three days to condition coated abrasives that have been affected by humidity. With the smaller type unit, it is necessary to anticipate needs.

Potassium carbonate is highly effective for humidity control. Its humidity range centers at 43 per cent; its cost is low; and it can be handled with normal caution. One tray of potassium carbonate properly maintained in a saturated solution will control between 40 and 50 cu ft of air.

Other Agents—Two other relatively harmless chemicals and humidities which can be expected from them are: Calcium chloride, 32 per cent; sodium dichromate, 52 per cent.

Where a walk-in storage unit is needed, call in air conditioning specialists to make recommendations for proper adjustment.



Test ingot, left, was not purged, the one at the right was. Note the unsound center and gas pockets in unpurged ingot. Though a poorer pipe formation is seen in the purged ingot, the section 2 in. down is sound

Air Purging Stops Metal Porosity

By ADAM J. TEXTER
Melting Superintendent
Firth Sterling Inc.
McKeesport, Pa.

MUCH has been learned in the last 20 years about the merits of flushing or purging molten metal in melting furnaces with gases. Oxygen, nitrogen and argon have been used with varying success.

At Firth Sterling's McKeesport, Pa., plant, we have installed apparatus for drying regular plant compressed air for flushing the bath. With it we do two things: Mixing of the bath before taking control sample; and elimination of dissolved gas which would cause ingot bleeding or porosity in the finished bar.

Here's How—One and a half minutes of mixing with air before taking a control preliminary gives us a truer chemical reading from the laboratory. The slight effect the air has on the slag has not been severe enough to change the bath composition chemically. One sample is sufficient where two or three used to be taken.

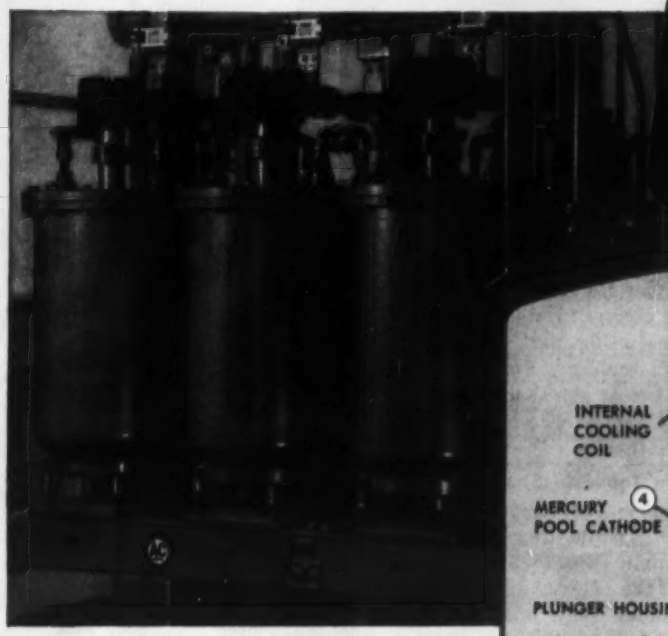
The air is dried with pressure regulated to maintain 30 psi at the furnace. Dew point is kept below minus 60°F. The lance consists of a 10-ft pipe on the end of a 20-ft air hose. The pipe is plunged to the lower level of the bath and kept moving throughout the blow. Because the air cools the 15,000-lb bath at the rate of 10°F for every minute of blowing, bath temperature should be a minimum of 2950°F before blowing begins.

Second Treatment—Heats that are more susceptible to gas absorption—some tool steels, air hardening grades and stainless—are further treated with a 5-minute purge after all alloys have been melted. A 3 x 3 x 14-in. test ingot is quenched in water and a 2-in. section is cut about 2 in. from the top.

The section is cut longitudinal-

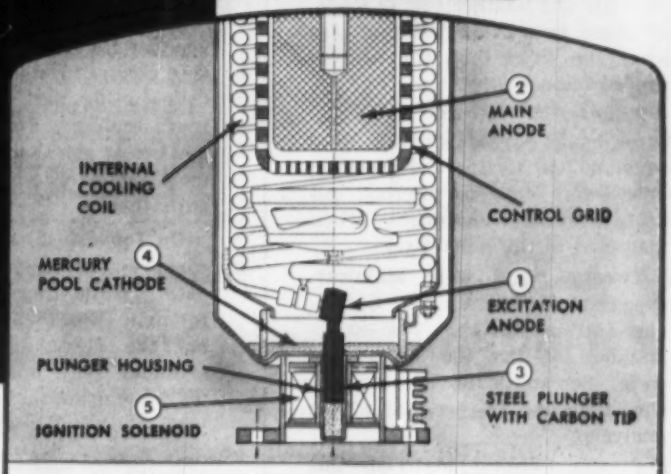
Here's the Rectifier That Needs

No Delicate Adjustments



This 1000-kw, 6-tube excitron rectifier is typical of units used for heavy-duty service in many industrial plants.

Mercury Arc Rectifiers



Unique Plunger Starts Continuous Excitation

The excitron tube has an excitation anode ① in addition to the main anode ②. With the excitation circuit de-energized, the steel plunger ③ floating in the mercury pool cathode ④ makes positive contact with the excitation anode (as shown).

When the excitation circuit is energized, the ignition solenoid ⑤ pulls the steel plunger ③ away from the excitation anode ① and under the mercury pool cathode ④, thus drawing a dc arc and forming the cathode spot, which makes conduction of load current by the tube possible.

If power is interrupted the plunger will float up, contact the excitation anode and automatically re-establish the excitation arc when power is restored.

LITTLE MAINTENANCE IS NEEDED with Allis-Chalmers excitron-type rectifiers. Excitation of the excitron rectifier is continuous, while other types of rectifiers require re-ignition 60 times a second.

Since it is more difficult to start a rectifier arc than to maintain it, the excitron rectifier is much less likely to lose excitation during operation. Momentary dips in supply voltage which are encountered in many supply systems have no effect on the continuous excitation arc.

Years of operation in hundreds of installations have proved the reliability and ease of operation of Allis-Chalmers mercury arc rectifiers. You can get complete information from your nearby A-C office. Or write Allis-Chalmers, Milwaukee 1, Wis.

A-4581

ALLIS-CHALMERS

ly across two corners, directly through the center and below the shrinkage cavity. If the exposed surfaces reveal no evidence of gas, the heat is tapped. If there is evidence of gas, the bath is again purged with dried air (length of time will depend on degree of gas noted) and another test ingot taken.

If the second ingot is bad, the bath is flushed with oxygen until all the silicon is oxidized. This usually produces excessive amounts of FeO in the bath and a temperature rise to 3100°F. After reconditioning the slag, the bath is again purged for 5 minutes with air and another test is made. If there is still evidence of gas after the third test, the heat is tapped for scrap.

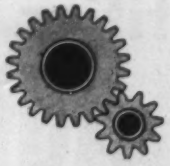
Proof—Fifty of the last fifty-three heats purged with air were sound at first testing and three required only a second purging. All heats were of prime quality when inspected in the billet size.

Twenty heats were stainless-type melted for aircraft quality specifications; 24 were low-carbon stainless of the 400 series; ten were die steels of 5 per cent chromium and 1½-per cent silicon analysis.

Plastic Purging Material—One of the newcomers to purging is a plastic compound called Solo-H. At temperatures above 600°F, the material releases free fluorine, but at a rate slow enough so that a ½-lb of plastic will give a boil of 40 to 90 seconds in molten steel. Material is used best in the ladle because the boil raises the steel level 3 to 5 in.

It is reported that 50 per cent of the dissolved hydrogen in stainless steels can be removed when the hydrogen level is about 0.0008 per cent by weight. We have used the plastic to improve the quality of 01-type oil-hardening steel. Such grades as 5 per cent chromium hot work steels and stainless have been improved with a 120-second boil.

Because the plastic has a low density, it must be immersed by attaching it to a bar and plunging it into the bath. Usually two 8-oz doughnuts of the plastic will supply 120 seconds of boil.



MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

CERAMIC cutting tools may be to machining what the jet engine has been to aviation. They bid fair to change even expert opinions on what's possible in metal cutting.

Nobody sees them as a panacea for all your cutting problems. Some question whether they'll fit in the cutting picture. But they figure to be a big part of tomorrow's tooling. You can get agreement on that from almost anyone who has worked with them.

On Top—Most ceramic tips come up short on ruggedness. While they are good for light cuts, they fall down on the heavy-duty ones; ceramics may specialize in finishing operations.

In addition to high hardness (say 93 Ra) and good wear resistance, the material has excellent thermal conductivity. Tips often are cool to the touch immediately after they've completed a cut. Combined properties make it a natural for ultra-high-speed cutting.

The Carboloy Department of GE has just announced that its cemented oxide will be available to users on a limited basis by Jan. 1, 1956. In the same report, Carboloy engineers predict the new material will influence the design of tomorrow's machine tools, "putting the emphasis on machines capable of removing metal *at speeds up to 7500 sfpm.*"

Here's what Carboloy tests on the tool material indicate:

- Wear resistance is so good it gives a tool life of "considerably more" than 25 to 1 over carbides on some jobs.

- Tips can be ground conventionally (wet) with a 220-grit diamond wheel. Finer grits take longer. Silicon carbide wheels can be used for rough grinding.

- Material doesn't heat up during cutting, can be used without coolant. Coolant may be used if heat deformation of the work is a factor.

- Tips are used with mechanical holders. They're often set on a carbide shelf for extra rigidity. Chip breakers also are carbide.

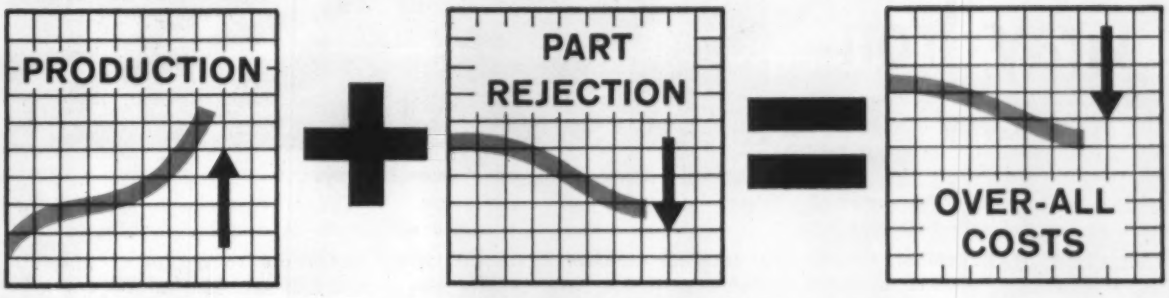
- In use, the tip must be set on center . . . tool and machine have to be rigid . . . don't dwell in the cut . . . infeed and outfeed are critical.

Carboloy engineers say interest shown in ceramic-type tools at the machine tool show in Chicago (STEEL, Sept. 12, p. 60) is responsible for the early availability of the material. At the booths where it was displayed and at the exhibits where it was being used, it was always one of the high interest points.

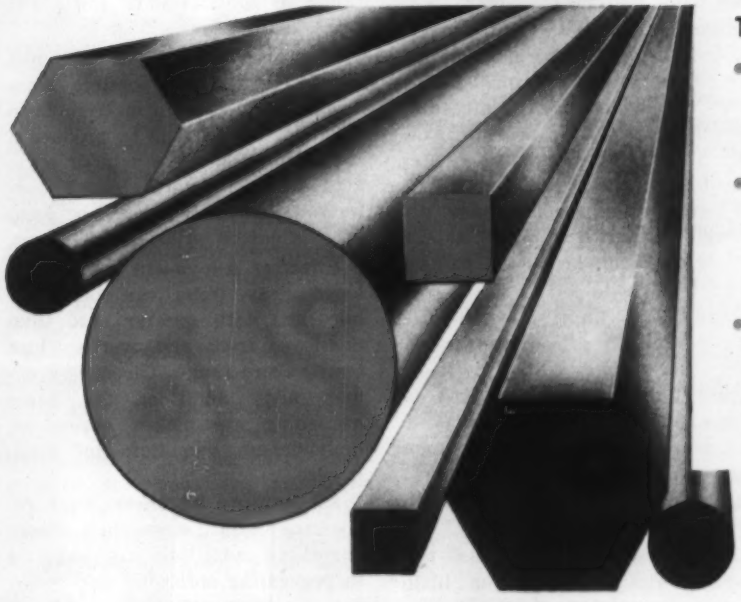
No one knows just how the new tool material will fit in with high speed steel, carbides and cast Stellites. Will it replace carbides? Leif Fersing, experimental engineer at Jones & Lamson Machine Co., doesn't think so. But as a superspeed cutting tool, particularly for light cuts and finishing, it's not just on the way. It is here.

J&L cold drawn leaded steel bars work to your over-all cost advantage

HERE'S HOW:



...they're free cutting and available in both Bessemer and Open Hearth grades



These versatile steel bars offer:

- IMPROVED MACHINABILITY—because they enable you to use faster cutting speeds, to secure longer tool life and to produce superior surface finishes.
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- HIGHEST QUALITY—because they must meet the rigid quality standards developed by J&L through years of leadership in the development and production of free-cutting steels.

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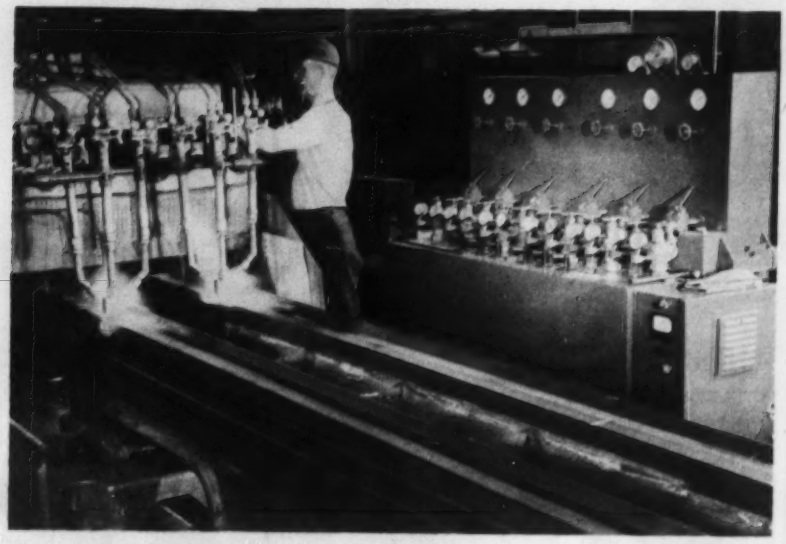
Heat Treating Gray Iron

PART II



Progressive flame hardening of lathe bedways

GREATER HARDNESS, greater wear resistance, greater strength —three impressive reasons for heat treating gray iron. By heating above the transformation temperature (about 1400°F) and then quenching, the soft pearlitic form of the iron can be changed to hard, wear-resistant martensite.

The analysis of the iron directly affects its response to heat treatment, particularly the position of the transformation temperature and the cooling rate necessary to produce the martensitic structure. Two essential conditions: The part should contain sufficient carbon in solution before cooling; it should contain a balance of other elements to facilitate the heat treatment.

Fortunately, by definition gray iron contains more than enough carbon to result in an optimum reaction to any hardening operation. Of course, alloys can be added to gray iron as to other ferrous materials to intensify hardenability.

Flame Hardening—This is the most common type of surface hardening for gray iron. The outer layer of a casting is heated to a temperature above the transformation range and then rapidly cooled to promote the formation of martensite. The result is a hard, wear-resistant outer layer and a core of softer gray iron.

Internal stresses introduced by flame hardening are usually less than those produced by through hardening. The ability to increase fatigue strength by producing compressive residual stresses on the surface of castings is just beginning to be realized.

Composition—Both plain and alloy gray irons can be successfully flame hardened. Carbon should be in a form which will readily dissolve in austenite on heating. Iron with a high percentage of pearlite, (combined carbon content of 0.5-0.9 per cent) is recommended, although iron with as little as 0.4 per cent combined carbon can be flame hardened.

It helps to know the composition because it affects the transformation range. For instance, carbide forming elements, such as chromium or vanadium, raise it and make somewhat higher flame hardening temperatures necessary. The normal range is between 1400 and 1500°F.

For maximum surface finish the casting should contain as little carbon as is necessary to produce sound castings free from danger of cracking. Coarse graphite flakes typical of a high carbon iron may be burned out during heating, producing a porous surface.

Silicon—Since high silicon promotes the formation of graphite and low combined carbon, the lower ranges of silicon content are desirable. Some operators say not more than 2 per cent. They also recommend that manganese be held in the 0.80 to 1.00 per cent range to contribute to the hardening action.

Gray iron to be flame hardened should be free as possible from porosity and foreign matter. Even small inclusions tend to produce a rough surface. Since skin or scale acts as an insulator, rough surfaces particularly should be sand or shotblasted prior to treatment.

Effect of Alloys—In general, alloyed gray irons can be flame hardened with greater ease than unalloyed irons and over a wider temperature range. The most common alloy additions for flame hardening are nickel, chromium, molybdenum, vanadium and manganese.

All improve hardness, wear resistance and strength. Small chromium additions are valuable in preventing softening and insuring retention of high combined carbon during heating.

Hardness — A plain gray iron (C 3.0; Si 1.7; Mn 0.60 to 0.80 per cent) will flame harden from 400 to 450 brinell. With the addition of 2.5 per cent nickel and 0.5 per cent chromium, average surface

hardness can be upped to 550 brinell. Adding 1.0-1.5 per cent nickel and 0.25 per cent molybdenum gives the same result.

This is apparent hardness, influenced by the soft graphite flakes. The material may be harder than steel (due to the high combined carbon and silicon) as shown by microhardness tests.

Design — Extra foundry stock, particularly on light sections, should be provided to allow for warpage and clean up. Holes should be countersunk and located in such a way that their outside is at least ¼-in. from an edge. Sudden changes from light to heavy sections in the flame-hardened area should be avoided, and sharp corners eliminated by generous fillets.

The flame-hardened area should be designed so that it may be heated uniformly; otherwise, there will be variation in the depth of the hardened layer. Re-entrant angles cause heat to dissipate rapidly and salient angles act as heat-concentrating spots, but flame hardening is the only way by which they can be satisfactorily hardened. Wall sections and ribs adjoining the hardened surface should be at least ½-in. thick.

Methods—The methods of flame hardening depend on the relative positions of the casting and the heating torch or torches. In *stationary hardening,* neither the casting nor the torch moves. The effect is limited to the area under the torch. In *progressive hardening,* work moves relative to the torch, or vice versa. Usually, the heated area is progressively quenched by a water spray which follows the torch.

In *spinning,* the work rotates under a stationary flame, usually until the entire periphery has reached the necessary temperature, at which point the flame is shut off and a quench applied. *Progressive spinning,* a combination of progressive hardening and spinning, is usually applied to long cylindrical castings. Frequently, the work is rotated between the centers of a lathe, while torches on the lathe carriage move along the work.

Structure — A fine martensitic structure is the ideal. If the temperature is increased, both plain and alloyed gray iron will form coarser martensite. Such a structure is usually satisfactory for high wear resistance but may prove harmful if impact loaded or locally stressed. Coarse martensite may also promote grinding cracks.

The importance of heating all the area to the proper temperature and no higher and to equal depth can not be overemphasized. Because temperature may be easily underestimated, a temperature indicator should be used when possible.

Care should be taken to avoid overheating at edges. Plugging holes with graphite or other heat-resistant materials, or using copper shields in holes and at sharp corners, will help prevent heat concentration from causing overheating.

Torch Tips — This easily controlled variable of flame hardening is usually adjusted to conform to the hardened depth desired. Speeds in the range of 4 to 7 ipm generally produce best results. The fuel most commonly used is acetylene, plus oxygen.

Highest temperature is reached when the surface of the casting is between 1/16 and ⅛-in. from the inner cone of the flame; distance between tip and work surface varies with tip sizes but usually falls in the 0.55 to 0.65-in. range.

The velocity of the oxygen-acetylene input is usually regulated at just below the blow-off point. An equal mixture of oxygen and acetylene has been found satisfactory. A slightly oxidizing flame produces a higher temperature, and should only be employed by experienced operators.

Quenching — Once heated, the casting must be quenched, usually by a water spray from holes in the heating head. The spray strikes the casting ½ to 1¼-in. behind the flame, the greater distance being used with alloy irons. Usual spray pressures are between 60 and 100 psi.

A less severe quench can be obtained with a mixture of soluble oil and water. Some high alloy irons may even be quenched in a stream of air.

Fore Quench—When castings of relatively thin cross section are to be hardened by the progressive method, a jet is sometimes installed which projects a water spray in front of the flame. This fore quench limits the heated area to the zone between the two jets and tends to minimize distortion.

The entire piece may sometimes be immersed in the quench so that the area to be heated lies just below the surface. The torch blows away the liquid, which closes over the heated spot as the torch moves on. This prevents preheating.

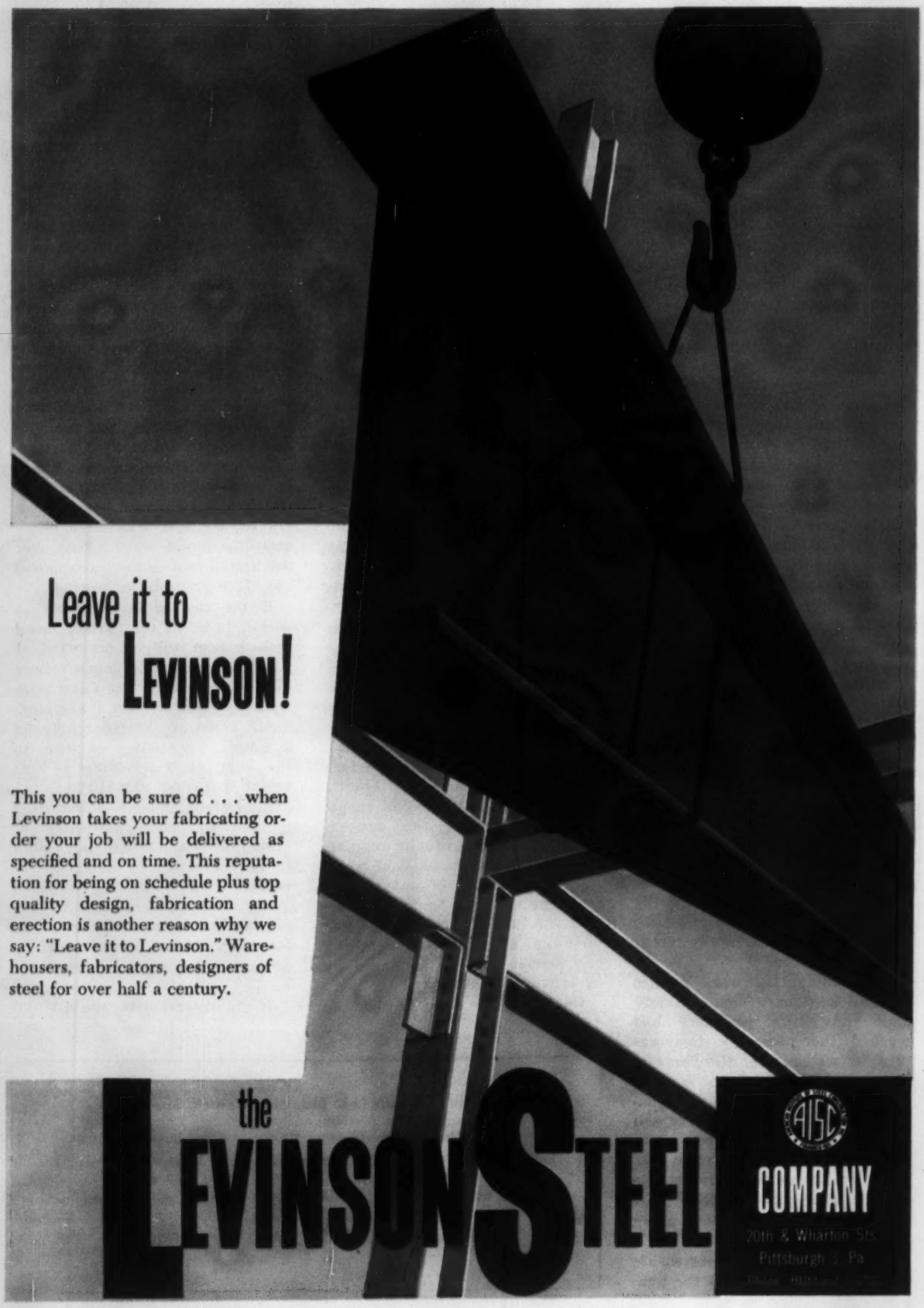
If the casting is immersed to within ½-in. of the surface being heated, heat will be extracted at a sufficient rate to promote formation of martensite. The same principle applies in spot hardening. Small areas are heated briefly by a torch. Dissipation of heat to the body of the casting is sufficient to harden the spots.

Control of Defects — Distortion induced by flame hardening of gray iron is small, and can usually be eliminated by avoiding unnecessary depth of the hardened layer. Partial immersion of the casting also reduces distortion. In long, flat castings, flame hardening on both sides will compensate for it.

If the distortion is caused by in-

Structural Changes in Induction Heated Gray Iron

Before heat treatment	Heating time	After heat treatment
Lamellar pearlite and coarse graphite	2.5 seconds	Fine acicular martensite and graphite flakes
same	3 seconds	Martensite and graphite flakes
same	3.5 seconds	Coarse martensite, iron carbide and fine graphite



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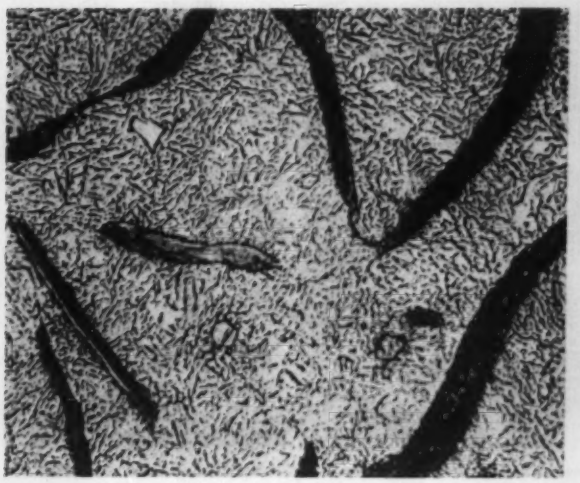


Fine martensitic structure of gray iron flame hardened for optimum wear resistance (X500)

Coarse martensitic structure of gray iron flame hardened at too high a temperature (X500)

ternal stresses induced during casting, a short stress-relief anneal at 1000°F, may be advisable.

Spalling is seldom a problem. It can be corrected by adjusting the composition of the material and by a less drastic quench.

After-Treatments — When possible, flame hardened castings should be stress relieved at low enough temperatures (300-400°F) to prevent loss of hardness. Heating in a furnace or in hot oil or by passing a flame over the surface will minimize the danger of distortion or cracking and will increase the toughness of the hardened layer.

Flame hardening is being regularly employed on gray iron parts for automobile engines, bearing housings, burners, compressors, gas regulators, diesel engines, high pressure valves, knitting machinery, machine tools, printing presses, textile machines, shafts and metal forming dies.

Induction Hardening — High equipment cost and the need for special coils normally limit induction hardening to applications where a large number of castings are to be hardened. The process is more rapid than flame hardening and more amenable to uniform results in production.

It requires a uniform base iron, since heating times are short and the response of the iron must be consistent or variations in hardness will occur. Quantity of alloy, solubility of carbides and amount of combined carbon must be considered in alloy irons.

It is particularly important that the iron have a combined carbon content of over 0.5 per cent.

Methods—There are three main types of induction hardening: In *static hardening* both coil and piece are stationary, so that the heat is applied to the entire surface at the same time. Only pieces of small surface area can be hardened by this method; large surfaces would require too large a power input.

In *spinning*, a method similar to the spinning method of flame hardening, the piece is rotated inside the inductor, assuring great uniformity of the hardened layer.

In *progressive hardening*, the work moves relative to the inductor, and only a narrow ribbon on the surface is heated at one time. Heating is immediately followed by a quench. This process is well suited to the hardening of large areas, since lower currents (and less expensive electrical equipment) are required.

Heating — Induction hardening and flame hardening depend on the same transformations. Temperatures are the same.

Overheating at holes is usually avoided by plugging them with tight-fitting copper, low carbon steel, fiber, wooden or cast iron inserts. If overheating of the entire surface should occur, it is usually advisable to lower the power input and increase time of the treatment.

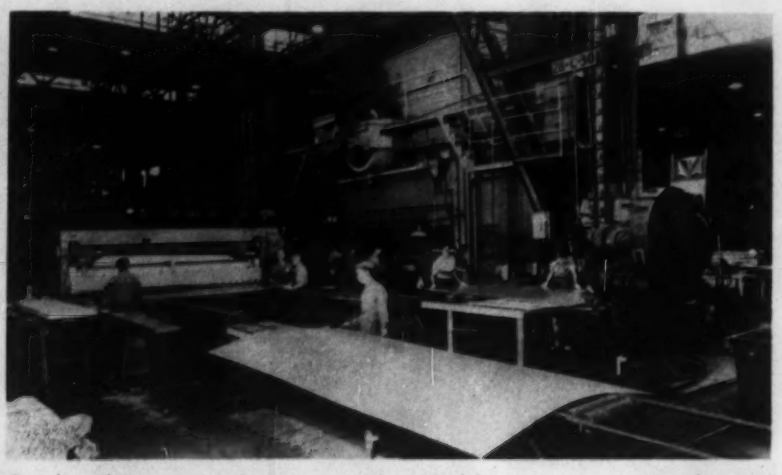
It is wise to consult manufacturers for specific recommendations on the times of treatment to be used for their machines. Other factors being equal, time for induction heating should be as short as possible to avoid local overheating.

Quenching—The usual quench is water sprayed on the surface immediately after the current is shut off. When the progressive method is employed, a quenching device is usually installed a short distance behind the induction coil head.

Induction hardening of gray iron has largely been limited to parts produced in great quantity. Typical examples are, automotive parts, camshafts, cylinder liners, textile machinery, bushings, cam followers, clutches, conveyor wheels, crankshafts, cylinder bores in motor blocks, engine and compressor castings, gears, grinder rings and cutters, hay-baler wire-knotting gear, machine tool parts and pump bodies.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Skyscraper's coat of stainless steel is formed on unusual die assemblies. Pattern is stretched over tool steel ridges. Dies can be altered for panel variations



Stainless sheets, sprayed with a wax forming lubricant, move into a shear to be trimmed to size. Then two slits are cut at the corners, and the sheets are ready to go to the press for bending and forming

Skeleton Dies Shape Stainless Skin

SEVEN thousand stainless steel panels weighing 350 tons sheathe Manhattan's newest skyscraper—the Socony Mobil building, which is the best evidence to date of stainless' move into the curtain wall phase of the building business.

The sheets are 20 gage, type 302 stainless. Each skin is press formed in a large pattern of trihedral shapes with a projection of 1½-in. The pattern is designed to prevent waviness and to break up reflections.

Wax Coat—Sheets are delivered in standard sizes to the fabricator, Commercial Shearing & Stamping Co., Youngstown. There they get a coat of Socony Mobil wax emulsion (Ceremul R, a forming lubricant), are trimmed to size and two slits are made at corners.

The sheets are ready for forming. Commercial uses a 2000-ton Clearing press for the five-step operation. Three sets of dies take the work from the flat sheet to the formed panel.

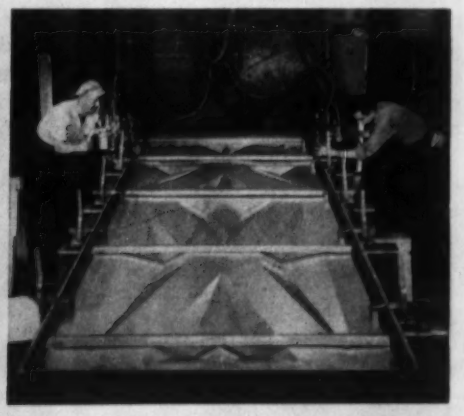
Steps—Dies on the "enter" side of the press do the first edge bend. The sheet is turned so edges are bent on both sides.

Then the sheet is transferred into the center of the die area where the trihedral pattern is formed. Finally, the sheet is passed to the exit side of the press where the final bend is put into both sides of it.

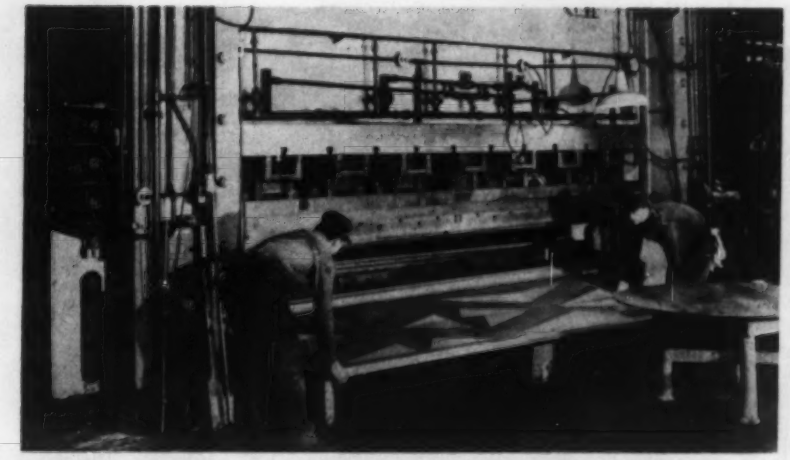
Variety—Not all the sheets for the building have the same formed pattern. Most have triangular pyramids. Some, in the spandrels, have four triangular faces. A big part of the job was to design and build the dies so they would accommodate minor variations in size and shape.

Complete sets of solid dies were ruled out. The cost would have been terrific. The answer lies in Commercial's unusual die assemblies. The complete setup consists

Unusual dies consist of skeleton pyramids. Most of the work is done by the tool steel ridges. Components of assembled dies can be moved to permit a change in pattern or a change in sheet size



Z-bar and hat-section stiffeners are locked in place and their ends are spot-welded to the edges of the panels



A finished panel comes off the press. Dies form the pattern. Dies in this press also complete two bending operations on the edges of the sheet. In the next operation, stiffeners are welded to the panels

of over a thousand major components which are assembled on top and bottom die plates.

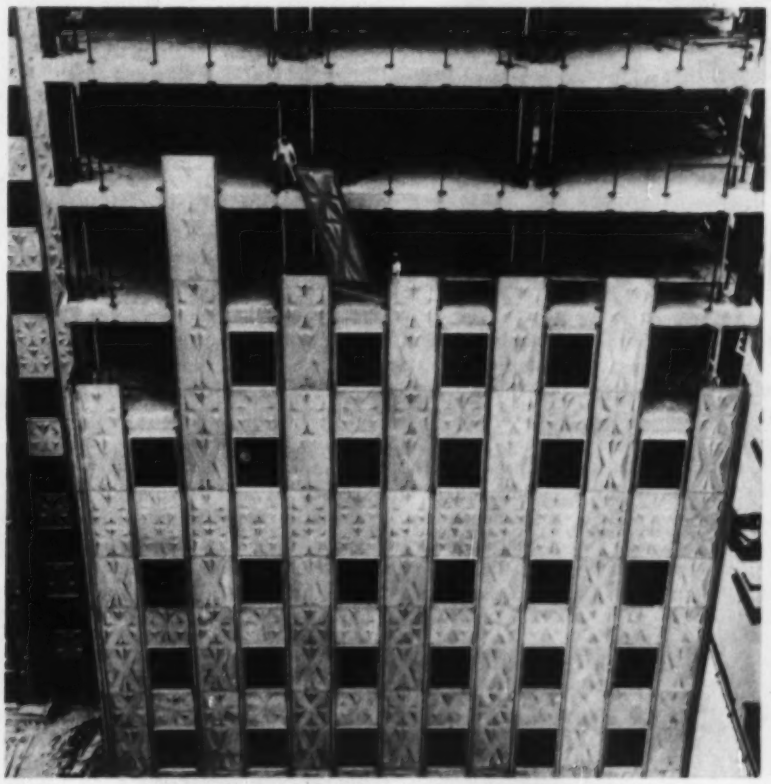
Skeletons — On the assumption that only the ridges of the dies do any work, Commercial's die men shied away from the standard approach of carving pyramids out of solid steel. They built skeleton pyramids of welded steel.

Tool steel ridges on the skeletons form the characters. The metal stretches flat between ridges because of tension applied by the forming operation. Flats between characters are kept flat by mated cast iron blocks.

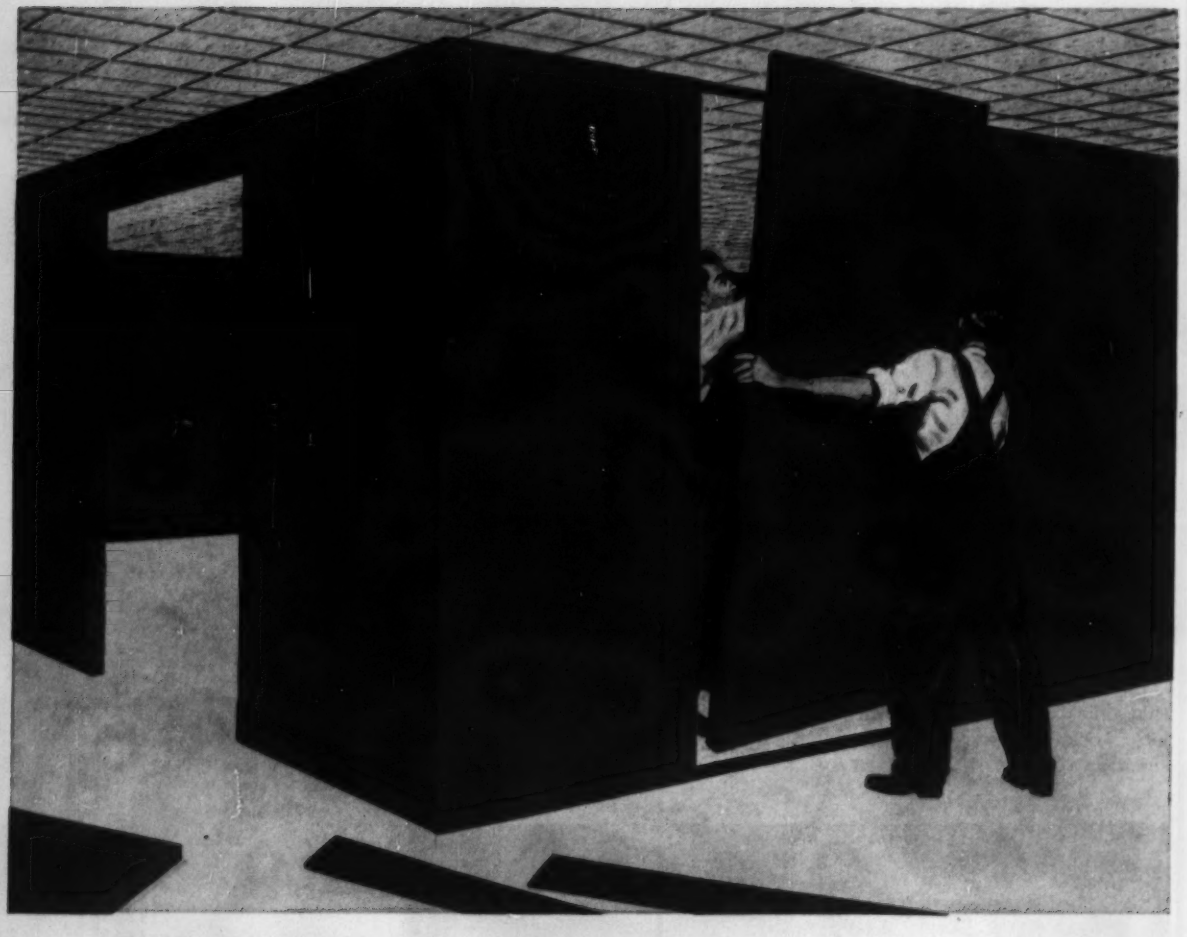
Welding—Commercial uses argon-shielded, tungsten - electrode arc welding to put small filler plates into the gaps opened up during forming. The gaps are final shapes of the corner slits cut during initial sheet preparation.

Spot welding machines tack Z-bars and a hat-shaped section to the panel backs. These members provide stiffness and rigidity. Holes in the stiffeners are used for attaching bolts.

Finished panels are inspected, packed in corrugated paper boxes with wooden braces and sent off to become the skin for New York's stainless spectacular.



Final chapter of the story comes when the panels are slipped in place to form the skin of the new building. Holes in the stiffeners are used to bolt the panels to the structure



Anticipate change with movable steel walls

Business can't afford to straitjacket efficiency by the expense, dirt and confusion involved in the relocation of interior masonry walls.

That's why easily installed movable walls made of steel are hailed as the economical way to preserve office flexibility and retain structural stability.

J&L helps manufacturers of movable steel walls build dependability and attractive appearance into these modern partitions. J&L furnishes the basic raw material—high quality sheet steel.

The acceptance accorded J&L Sheet Steel by movable wall builders shows how quality control is coupled with J&L's understanding of product end-use. Thus J&L assures customer satisfaction.

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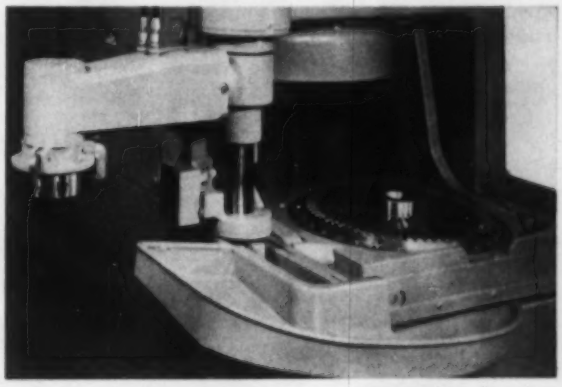
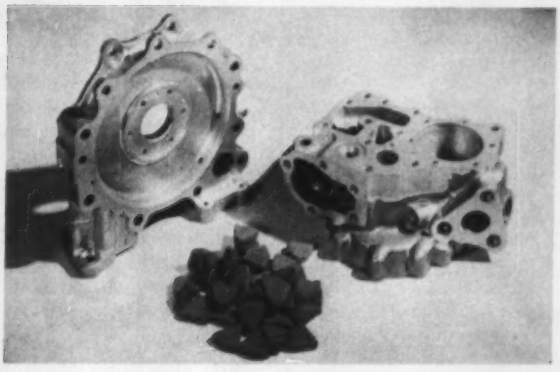
The press accommodates round, flat or irregularly shaped parts up to 15 in. in the largest dimension.

Quenching is under close automatic control at all stages of the quenching cycle. Parts are held between accurate dies during the cycle. *Write*: Gleason Works, 1000 University Ave., Rochester 3, N. Y. *Phone*: Greenfield 1000



New Barrel Finishing Abrasive Prevents Wedging



Many intricate parts now can be barrel finished by using a vitrified bonded triangular abrasive.

Sizes and shapes are uniform. The compound, Tumblex T, wears away evenly and does not chip or fracture. It is chemically inert and is not affected by acids, compounds or detergents. The material weighs 85 pounds per cubic foot.

Another new abrasive, Tumblex N, is especially good for diecastings because of its slower cutting action. When additional cutting action is required, small amounts of loose abrasive can be added.

This stone brings out a good color on steel, zinc, brass, aluminum and stainless steel. *Write*: Norton Co., Worcester 6, Mass. *Phone*: Pleasant 2-4641

Lift Truck Has 79-in. Turning Radius

This 5000-lb capacity truck can do more work because of its short length, narrow width and steering ease.

With a net weight of only 7110 lb, it can operate on lightweight floors.

A low center of gravity and a 51-in. wheelbase improve traction, weight distribution and operating ease.

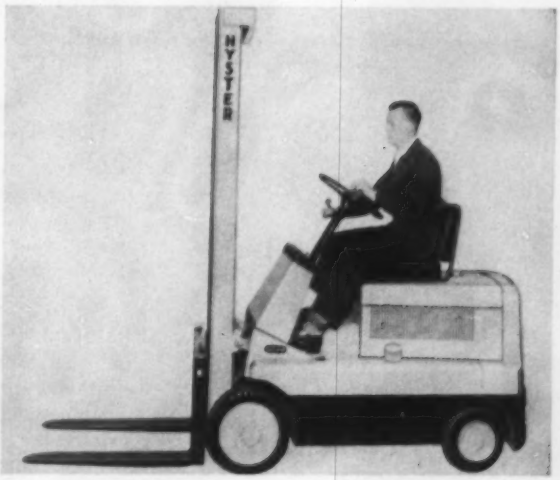
Power is supplied by a 35-hp gasoline engine. Options: Diesel engine and LP gas conversion units.

Top travel speeds are 9.5 mph forward, 9 mph in reverse.

Standard lift height is 10 ft. Tilt is 5 degrees forward, 10 degrees back.

With a full load, the maximum grade is 18 degrees. On a 2-per-cent grade, top towing capacity is 54,000 lb.

A complete line of attachments includes a boom and a scoop. *Write*: Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg. *Phone*: Tuxedo 5011

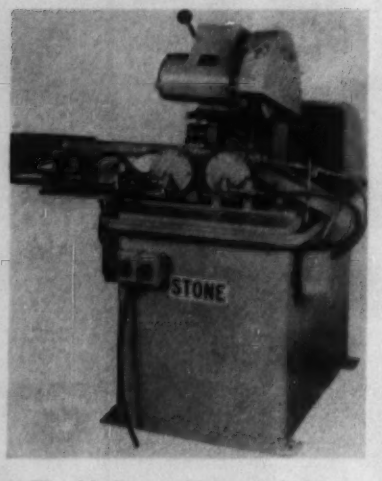


NEW PRODUCTS and equipment

Automatic Cutoff

Any length of nonferrous stock can be cut by this machine. It has an automatic feed for bar stock and turns out work with a milled-like finish.

One firm cut brass solids 1 sq in. in cross section into ⅝-in. lengths at the rate of 1500 an hour.

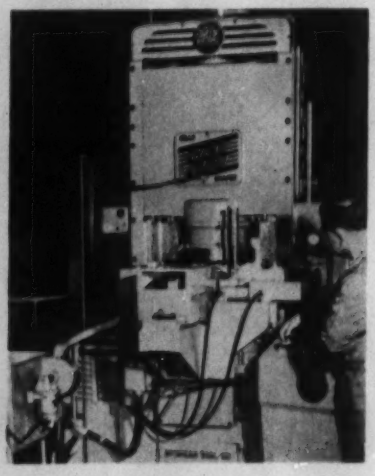


The blade, an 80-tooth Si-Maloy steel saw, was still good after cutting over 90,000 pieces. Tolerances were held under 0.005 in. *Write*: Stone Machinery Co. Inc., Manlius, N. Y. *Phone*: Manlius 62-2411

Automated Gear Shapers

This machine loads, unloads, cuts, checks and washes gears. When necessary, it resets itself.

When tools start to dull, the control panel shuts down the gear shaper for tool change. By shutting down at the beginning of tool dullness, maximum production is maintained; less stock has to be ground off in resharpening than if tools are allowed to get extremely dull.

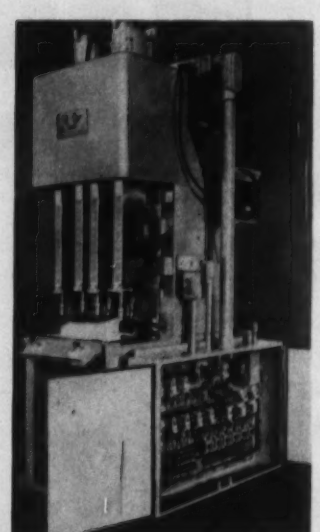


All gears are inspected 100 per cent for size. *Write*: Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. *Phone*: Twinbrook 1-3111

Stud Driver

Studs can be driven simultaneously at angles up to 30 degrees from the vertical with this new machine. There are two models, one drives up to 6 studs, the other, 12.

The machine is extremely flexible; heads can be changed to a new pattern in less than an hour. A vibrator hopper feed sorts and delivers studs to positioning fingers, ready to drive. Each head is driven by a separate motor with its own interlocking control circuit.



Two buttons must be depressed simultaneously to operate the machine. *Write*: Syracuse Special Machine Co., 2900 Erie Blvd. E., Syracuse 3, N. Y. *Phone*: 73-6511

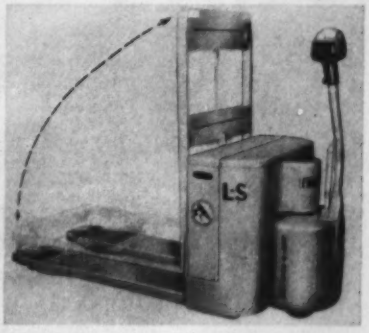
Spray Valve

A constant flow angle under all conditions is assured by a parabolic plug. The valve is made of corrosion-resistant stainless steel, is nonsticking and requires no maintenance. It is used with deaerating heaters and hot process softeners. *Write*: Graves Water Conditioning Co., division, Graves Tank & Mfg. Co. Inc., 216 W. 14th St., New York 11, N. Y. *Phone*: Watkins 4-2321

Pallet Truck

A hinged superframe on this electric unit enables it to handle skid platforms as well as pallets.

When the truck is used for pallet handling, the superframe is locked



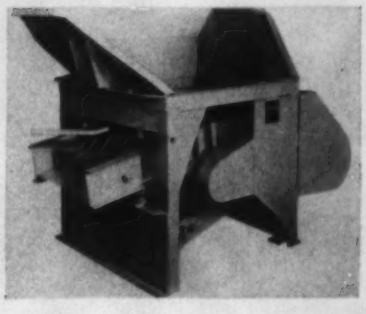
in the up position and the lowered height is 3¼-in. When used for handling skid platforms, the superframe is down and increases the lowered height any amount up to 11½-in.

The truck has a vertical lift of 4 in.; it can handle single or double-face pallets and skids of any underclearance.

A double reduction gear drive gives traction speeds of 3 mph empty, 2.3 mph loaded. Capacities go up to 6000 lb. *Write*: Dept. R-30, Lewis-Shepard Products Inc., Watertown, Mass. *Phone*: Watertown 4-5400

Sand Screener

Low cost mechanization is added to sand preparation by this self-

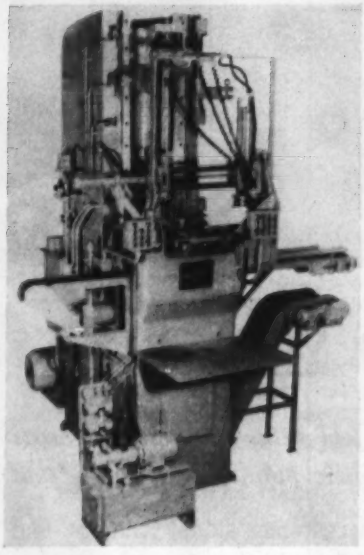


contained screening and separating unit.

Capacity is 50 tons an hour. The unit has a 30-cu-ft hopper and a radial magnetic pulley for tramp iron removal. Controlled vibration permits adjustment of the feed rate and the intensity of screen vibration. *Write*: National Engineering Co., Machinery Hall Bldg., Chicago 6, Ill. *Phone*: State 2-6148

Broaching Machine

In conveyor-line automation, this machine automatically picks up parts, broaches them and puts them back onto the line.



The 30-ton pull-down machine has a 60-in. stroke and an automatic chip conveyor. A full follow-up retriever mechanism follows the broach through the stroke. *Write*: American Broach & Machine Co., 415 W. Huron St., Ann Arbor, Mich. *Phone*: Normandy 2-5621

Wire Ring Roller

Rings of round or flat wire are rolled by this machine. Circle diameters range from 2 to 30 in. Power is provided by a ½-hp motor.

Five wires 3/16-in. in diameter can be rolled. *Write*: Penn Machinery Co., 117 N. Third St., Philadelphia 6, Pa. *Phone*: Market 7-0677

NEW Literature

Write directly to the company for a copy

Sheet Handling

Here's the description of a transfer machine that moves large sheet panels automatically—4 pages. Sahlin Engineering Co. Inc., P.O. Box 289, Birmingham, Mich.

Jig Borers

Specifications and applications of a series of borers are given—28 pages. Pratt & Whitney Co. Inc., West Hartford 1, Conn.

Test Bars

The design and making of aluminum alloy and copper-base test bars are described. Metallurgical Dept., George Sall Metals Co. Inc., 2300 E. Butler St., Philadelphia 37, Pa.

Barrel Finishing

Here's information on compounds for barrel finishing of all metals—4 pages. Speed-D-Burr Division, Miller Machine Tool & Gauge Co., 3613 San Fernando Rd., Glendale 4, Calif.

Grinding and Lapping

Specifications and photos show the complete line of grinding and lapping machines—catalog 1843, 32 pages. Norton Co., Worcester 6, Mass.

Ceramics

Porcelain, stoneware, coatings, graphite and alumina and their resistance to corrosion in chemical equipment are covered—bulletin CHE-R5, 16 pages. Chemical Equipment Division, General Ceramics Corp., Keasbey, N. J.

Bulk Handling

Here is the story of a manganese steel pan feeder—bulletin 255, 16 pages. Stephens-Adamson Mfg. Co., Aurora, Ill.

Tractor Shovel

Engineering, design and production stories of a 2¼-yd tractor shovel are presented pictorially—catalog MS-460, 8 pages. Construction Machinery Division, Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Stainless Wire and Strip

Mechanical properties and spring characteristics of precipitation hardening stainless steel, type 17-7 PH, are detailed—bulletin T-1. Alloy Metal Wire Division, H. K. Porter Company Inc., Prospect Park, Pa.

Temperature Measurement

Physical effects of temperature and the concept of heat are described—8 pages. Tempil® Corp., 132 W. 22nd St., New York 11, N. Y.

Clamshell Buckets

Here's information on the care and maintenance of clamshell buckets—bulletin 2373-R, 40 pages. Bucket Department, Blaw-Knox Co., Pittsburgh 38, Pa.

Pressroom Safety

Described are vacuum sheet lifters and safety equipment for presses—24 pages. Air-Vacuum Division, F. J. Littell Machine Co., 4555 N. Ravenswood Ave., Chicago 40, Ill.

Machining Aluminum

All phases of machining aluminum are covered. This book is designed to help production, engineering and plant personnel—320 pages. Dept. F-32, Technical Editor, Kaiser Aluminum & Chemical Sales Inc., 228 N. LaSalle St., Chicago 1, Ill.

Battery Maintenance

Industrial cycle servicing of lead acid batteries for all types of motive power use is covered—48 pages. Manager Headquarters Service, C & D Batteries Inc., Washington & Cherry Sts., Conshohocken, Pa.

Transfer Equipment

Twenty materials handling and special processing units are described—16 pages. Process Equipment Division, W. F. & John Barnes Co., 369 S. Water St., Rockford, Ill.

Industrial Furnaces

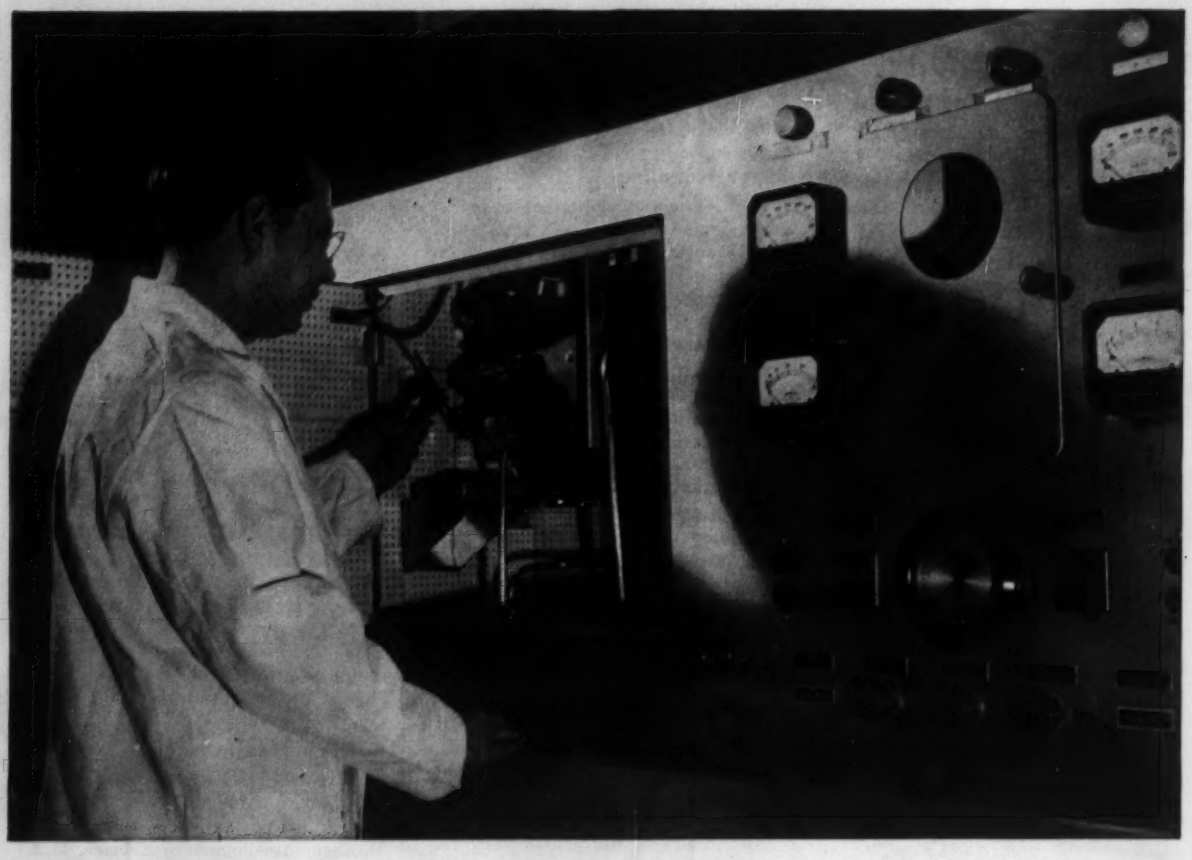
Heating furnaces, heat treating furnaces, forging manipulators and heavy materials handling equipment are covered—31 pages. Salem-Brosius Inc., Arch St., Carnegie, Pa.

Wet Tumbling

Recommendations for selecting compounds for various finishing requirements are combined with information on tumbling barrels—bulletin XL-55. Tumb-L-Matic Inc., 4510 Bullard Ave., New York 70, N. Y.

Epoxy Resins

Here is information on Epocast 4-B and 4-B-2—bulletin EP-54-10, 3 pages. Epocast 4-C and 4-D, filled resins containing aluminum powder, are covered in bulletin EP-55-61, 3 pages. Furane Plastics Inc., 4516 Brazil St., Los Angeles 39, Calif.



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Market Outlook

HOT-ROLLED carbon sheets may be the most difficult steel product to get in early 1956.

Reports persist that four Pittsburgh area mills are dropping out of the hot-rolled carbon sheet market for at least the early part of the year. Those mills deny the reports. Some of them explain they will have a large carry-over of orders into 1956 and will be unable to take new orders for delivery in the early part of the year.

NOT ENOUGH— Whatever the mill policies may be, consumers will not get all of the hot-rolled sheets they seek.

Steel is in such strong demand there isn't enough to go around, even though mills are producing near capacity. Mills have to decide how much tonnage they will allot to their various products. Factors influencing their decisions include the extent of demand, profitability and ability to produce the various products.

BIG ITEM— Hot-rolled sheet is the second most important product tonnagewise in mill shipments of carbon steel. Biggest product is cold-rolled sheets. Of the 51,302,404 net tons of finished carbon steel shipped by mills in the first eight months of this year, 9,613,229 tons were cold-rolled sheets and 5,897,681 tons were hot-rolled sheets.

NO LET-UP— Cold-rolled sheets, a product into which hot-rolled sheet tonnage might be diverted, have been in strong demand all year. The biggest consumer of cold-rolled carbon sheets is the automobile industry. It took slightly more than half of them in the first half of this year. And it looks like it will continue to pull heavily on the supply. L. W. Smead, general sales manager of Ford Motor Co.'s Ford division, says the first month of sales of 1956 Fords surpassed sales of any similar introductory period.

SIGN OF THE TIMES— Among other steel products in strong demand are structurals and plates. Structural demand is highly active and well diversified, considering the advancing season of the year. Reflecting the pressure for plates, two eastern mills put their prices of plates $6 a ton above the market. Plate fabricators are unable to place orders for all the plate they would like for the first quarter. Demand is expected to increase further as producers of large-diameter pipe, railroad freight car builders and shipyards express their needs. Freight car builders had 4½-times as many cars on their order books on Oct. 1 of this year as they had on the same date a year ago.

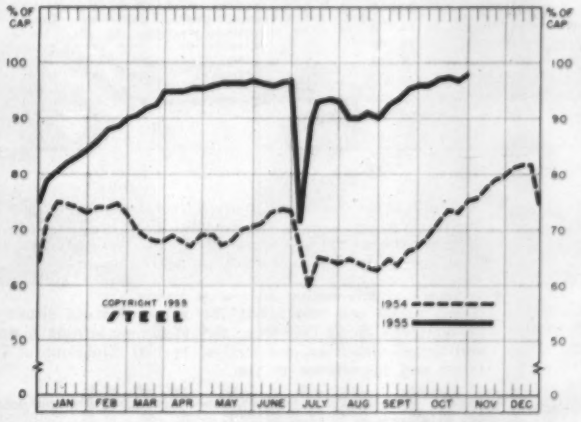
BUSIER— Another indication of the high level of business is the workweek at foundries. Some jobbing shops are working six days a week.

Also reflecting the high rate of activity in the iron and steel industry is the production of steel for ingots and castings in the week ended Oct. 30. Operations were at 98 per cent of capacity, 1 point over the preceding week.

PRICES— With steel in such strong demand, the price undertone is strong. STEEL's arithmetical price composite on finished steel is sustained at $128.14 a net ton.

Prices of galvanized steel products remain unchanged, because zinc price increases by a few producers did not stick.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Oct. 30	Change	Same Week 1954	Same Week 1953
Pittsburgh	102	0	73	96
Chicago	98.5	+ 1.5	79	99
Mid-Atlantic	98	+ 1.5	69	95
Youngstown	100	0	72.5	100
Wheeling	100	+ 1	80	98.5
Cleveland	102.5	+ 1*	88	103
Buffalo	105	0	87.5	106.5
Birmingham	94	— 3.5	71	96.5
New England	90	0	59	82
Cincinnati	90	+ 3.5	69.5	88
St. Louis	97	— 9	84	96
Detroit	100.5	+ 2.5	80	97.5
Western	91	—11	81	101
National Rate	98	+ 1	75	94

INGOT PRODUCTION‡

	Week Ended Oct. 30	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	147.5†	148.5	145.7	110.6
NET TONS (In thousands)	2,370†	2,386	2,341	1,776

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 29 Technical Outlook—p. 65

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Oct. 25 1955	Oct. 18 1955	Month Ago	Oct. Average
(1947-1949=100)	154.5	154.5	153.9	154.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Oct. 25

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parenthesis. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.200
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	7.993
Tie Plates	5.625	Strip, C. R., Stainless, 430 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.350
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.366
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	19.971
Structural Shapes	4.567	Pipe, Line (100 ft)	158.925
Bars, Tool Steel, Carbon (lb)	0.466	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.375	Tubing, Mechanical, Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.933
Bars, H.R., Carbon	5.350	Tin Plate, Electrolytic, 0.25 lb	7.633
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.733
Bars, C.F., Carbon	8.660	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.175	Wire, Drawn, Stainless, 430 (lb)	0.578
Bars, C.F., Stainless, 302 (lb)	0.468	Bale ties (bundle)	6.473
Sheets, H.R. Carbon	5.145	Nails, Wire, 8d Common	8.618
Sheets, C.R., Carbon	6.239	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.690	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless, 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Oct. 26 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	208.90	208.90	207.56	194.53	157.76
Index in cents per lb	5.661	5.661	5.623	5.270	4.274

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$128.14	$128.14	$127.41	$117.95	$94.50
No. 2 Fdry. Pig Iron, GT	58.99	58.99	58.99	56.64	48.84
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	47.72
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	49.13
Steelmaking Scrap, GT	45.00	45.00	45.00	33.67	41.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Oct. 26 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.45
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.45
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	3.93
Bars, C.F., Pittsburgh	5.90	5.90	5.90	5.40	4.15
Shapes Std., Pittsburgh	4.60	4.60	4.60	4.25	3.40
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.40
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.46
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.50
Plates, Chicago	4.50	4.50	4.50	4.225	3.50
Plates, Coatesville, Pa.	4.80	4.80	4.50	4.225	3.90
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.50
Plates, Claymont, Del.	4.80	4.50	4.50	4.225	3.90
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.35
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.35
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.15	4.40
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.50
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.25
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.15-4.50
Strip, C.R., Chicago	6.35	6.35	6.35	6.00	4.30
Strip, C.R., Detroit	6.35	6.35	6.35	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	6.25	6.25	6.25	5.75	4.50
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.45	$9.45	$9.05	$9.05	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$63.00
Wire rods, 7/32-1/2" Pitts.	5.025	5.025	5.025	4.675	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$48.50
Basic, Valley	58.50	58.50	58.50	56.00	47.50
Basic, deld. Phila.	62.16	62.16	59.16	59.66	50.39
No. 2 Fdry. Pitts.	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	46.50-49.50
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, deld. Phila.	62.66	62.66	59.66	59.16	50.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	45.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	52.58
Malleable, Valley	59.00	59.00	59.00	56.50	49.50
Malleable, Chicago	59.00	59.00	59.00	56.50	48.00
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	190.00†	175.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.50	$44.50	$43.50	$32.50	$44.00
No. 1 Heavy Melt, E. Pa.	46.50	46.50	46.50	32.50	39.00
No. 1 Heavy Melt, Chicago	44.00	44.00	45.00	33.00	40.00
No. 1 Heavy Melt, Valley	48.00	48.00	46.50	35.50	43.75
No. 1 Heavy Melt, Cleve.	45.50	45.50	44.00	32.50	43.25
No. 1 Heavy Melt, Buffalo	38.50	38.50	38.50	30.50	41.50
Rail, Rerolling, Chicago	65.50	65.50	64.50	54.50	61.00
No. 1 Cast, Chicago	47.50	48.50	47.50	39.50	50.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.625	$13.625	$13.625	$13.75	$14.25
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	16.50
Oven, Fdry, Chicago	25.75	25.75	25.75	24.50	21.00

Daily Nonferrous Price Record

	Price Oct. 26	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct. 1954 Avg.
Copper	43.00-45.50	Oct. 7, 1955	43.00-50.00	45.380	37.759	30.000
Lead	15.30	Sept. 26, 1955	14.80	14.920	14.800	14.775
Zinc	13.00	Oct. 21, 1955	13.00-13.50	12.940	12.500	11.500
Tin	96.375	Oct. 26, 1955	96.25	96.565	96.519	93.110
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	24.40	Aug. 8, 1955	23.20-24.40	24.400	24.267	22.200
Magnesium	32.50	Aug. 16, 1955	28.50	32.500	30.574	27.000

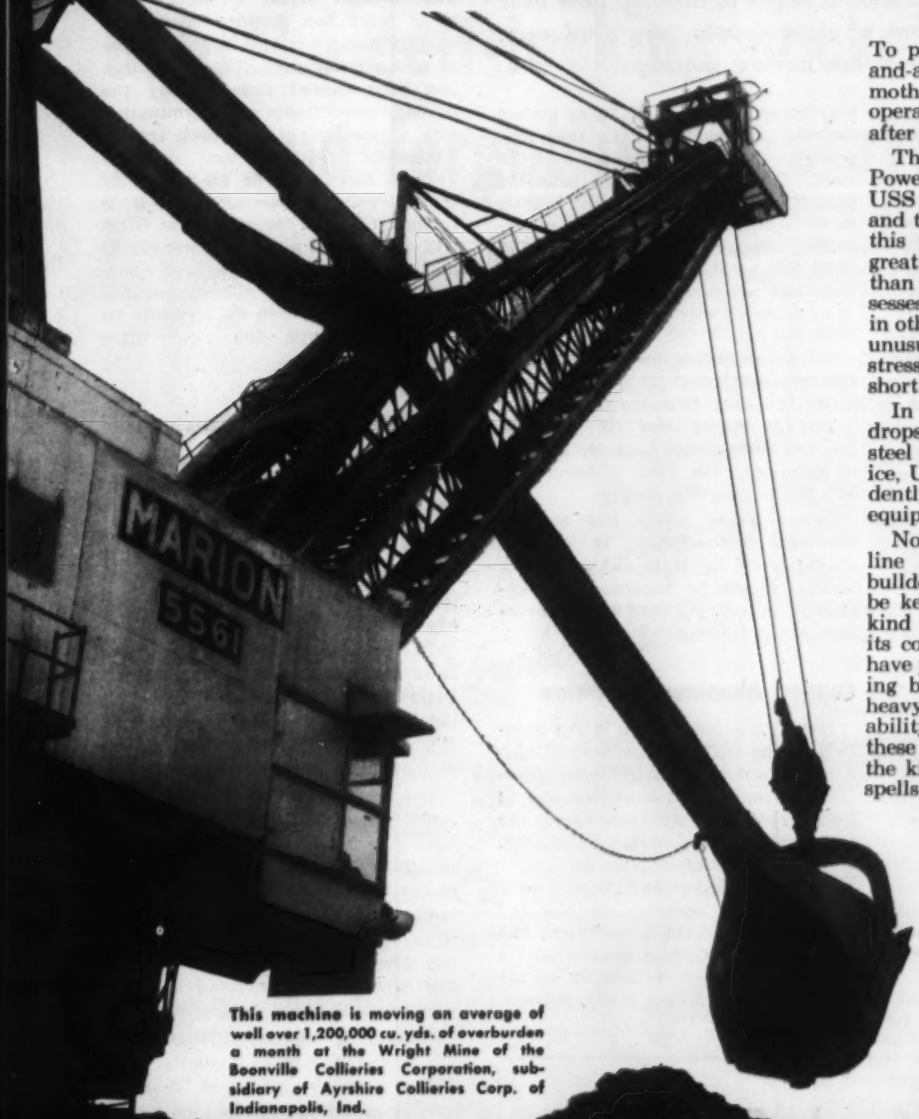
Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

Massive boom built of USS TRI-TEN Steel

helps to keep this giant shovel working around-the-clock all year 'round



This machine is moving an average of well over 1,200,000 cu. yds. of overburden a month at the Wright Mine of the Boonville Collieries Corporation, subsidiary of Ayrshire Collieries Corp. of Indianapolis, Ind.

To pay off on the more than a million-and-a-half dollars invested in this mammoth 45-cu. yd. power shovel, it must operate *continuously*—24 hours a day, day after day, every month in the year.

That's why the engineers of the Marion Power Shovel Co., Marion, O., selected USS TRI-TEN Steel for all plates, angles and tees in the massive 120 ft. boom. For this tough, versatile steel not only has great strength—a 50% higher yield point than carbon steel—but in addition possesses an important advantage well proved in other similar construction . . . it has the unusual ability to withstand shock and stress at sub-zero temperatures. Here, in short is a true *all-weather* steel.

In other words, when the thermometer drops to the point where a less efficient steel might tend to crack and fail in service, USS TRI-TEN construction can confidently be depended upon to keep the equipment profitably on the job.

Not only in booms like this, but in drag line buckets, heavy-duty truck frames, bulldozers and power shovels that must be kept working hour after hour in any kind of climate, USS TRI-TEN Steel and its companion, USS TRI-TEN "E" Steel, have proved their superiority by minimizing breakdown hazards. In hundreds of heavy-duty applications, where dependability is of prime importance, the use of these high strength steels has resulted in the kind of uninterrupted operation that spells bigger output at lower cost.

NOW AVAILABLE . . . Our new "Design Manual for High Strength Steels" is ready for distribution. This 174-page book is free. It contains comprehensive and practical information that you will find extremely useful in designing your equipment for greater economy and efficiency by the sound use of high strength steels. For your copy, write on your company letterhead giving your title or department, to United States Steel Corporation, Room 5025, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS TRI-TEN • USS COR-TEN • USS MAN-TEN

5-1834

UNITED STATES STEEL

Nonferrous Metals

Engineers and designers should begin to develop new uses for tungsten without fear of tight supply, say producers. They explain: "There never has been a shortage"

Nonferrous Metal Prices, Pages 92 & 93

DEVELOPMENT OF NEW uses for tungsten is being retarded due to a misconception. People believe "our nation's tungsten situation is little short of desperate," report tungsten producers.

The Bureau of Mines statistical report for 1954 (see table) shows that available tungsten (U.S. mined and imported) outstripped consumption 9 to 1. The balance went into stockpile.

Phillip M. McKenna, president, Kennametal Inc., reports: "If engineers knew that tungsten would be plentiful for the next 20 years, they could plan on larger uses for it."

History—Stockpiling ends June 30, 1956—sooner, if 3 million units are obtained from domestic sources. The tungsten market is sustained by stockpiling purchases ($63 unit). A unit is 20 lb of tungsten trioxide or 15.86 lb of tungsten metal.

Cloud on the horizon: The government may want to extend the stockpiling program. Industry spokesmen feel that such a move may retard progress in the use of tungsten carbide alloys. Tungsten advocates argue that the government should not continue to use funds "simply to take the valuable mineral out of use." Many are deterred, Mr. McKenna reports, from starting engineering and experimental work for new uses because there is no way to judge future supplies.

Current Status—Domestic production (over 13 million lb, 1954) makes the U.S. self-sufficient. In 1951, the peak year, only 11.4 million lb were used. Tungsten producers estimate that the government has 133 million lb in stockpile. In 1943, the recoverable reserves were estimated at 117.6 million lb. Since this time, the U.S. has consumed 95.2 million lb in addition to supplying tungsten for stockpile.

Advanced mining methods and new reserves discovered by industry have made the 1943 estimate obsolete.

The increased use of tungsten powder, from which tungsten carbide is produced, has been a barometer of a better tungsten supply.

Crux: There never has been a shortage of tungsten. If supplies should ever be tight, explain producers, it will be because of a bottleneck in refining and/or engineering—not in the basic supply.

Copper, Aluminum Diversion

Not if, but how much, is the question as the Office of Defense Mobilization sits down to study what quantities of copper and aluminum should be diverted from stockpile during the first quarter of 1956. A decision should be reached by Nov. 15.

World developments in copper may affect ODM's decision on the red metal. The Chilean government has authorized the Copper department to sell two-thirds of its output to the U.S. (formerly 30 per cent). Reason: The London Metal Exchange forward price has dropped until it is slightly under the U.S. primary price of 43 cents a pound. The price drop has been caused primarily by the British government's determination (via a new budget) to check the inflationary trend in that country. Though there will be an easing of the domestic copper situation, it is thought by most observers that ODM will continue to forgive copper stockpile quotas through the first quarter of next year. Aluminum, continuing to be tight, will undoubtedly be forgiven through the first three months of 1956.

Germans Brighten Aluminum

A German firm, Vereinigte Aluminum Werke A.G., is making 99.998 per cent electrolytic aluminum at its Erft Works for bumpers, headlamps, reflectors and trim on automobiles. The exceedingly bright metal is being offered as a substitute for nickel and chromium.

The price is 4 Deutsche marks per kilogram, or 43 cents a pound. Heinz Peters, technical director, says it's not practical to plate the material. It's applied like foil in a thickness of 0.078 in.

The company's Toerning Works in south Germany escaped bomb damage but later was partially dismantled. It has been rebuilt and can produce 45,000 metric tons of aluminum a year when adequate water power is available. Part of the power is generated as alternating current and converted to direct current with mercury-arc rectifiers.

Germany's capacity: 140,000 metric tons of aluminum annually. Some 35,000 tons are produced at Lippe Works at Lunen, 20,000 tons by the Erft Works and 40,000 tons at Rheinfelden on the Upper Rhine near the Swiss border.

Aluminum Homes Around Corner

S S. Inch, vice president, Kaiser Aluminum & Chemical Corp., says the time is not far off when aluminum "will find itself one of the basic metals for homes that will be flexible, comfortable and economical places to live." Such homes could be prefabricated in giant factories and shipped to construction sites where they could be erected in a matter of hours, he says.

Tungsten Supply Grows

(in thousands of lb)

	Domestic Production	Imports	Consumption
1954	13,136	22,989	4,037
1953	9,259	28,994	7,734
1952	7,233	16,985	8,634
1951	5,914	7,533	11,410
1950	3,965	8,342	6,597

You can set a new High-Torque Unbrako self-locking socket set screw and forget it—it stays tight

There are several reasons: the deeper socket which gives you better purchase with the wrench; the rounded socket corners which eliminate the sharp corners where cracks start; the special methods of heat treatment in atmosphere-controlled furnaces; the development of fully formed threads.

Up to 40% higher tightening torque— a new Unbrako feature

RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES (Inch-Pounds)

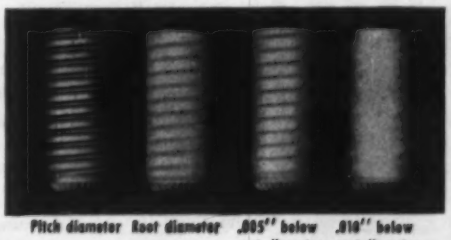
SCREW SIZE	UNBRAKO	SET SCREW B	SET SCREW C	MINIMUM DIFFERENTIAL %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

ALL UNBRAKOs can withstand higher tightening torques than ordinary set screws. For example, the recommended torque for a ¼" UNBRAKO is 87 inch-pounds—40% greater than that recommended for an ordinary set screw.

These microphotographs illustrate just what fully formed threads do for the new High-Torque UNBRAKO. They make the whole screw stronger. The metal is compressed into the closely knit grain structure that you see. The grain flow follows the contour of the threads. There are no straight lines along which shear can occur. The UNBRAKO retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

You can't buy a better set screw than an UNBRAKO. See your authorized industrial distributor today. Or write STANDARD PRESSED STEEL Co., Jenkintown 33, Pa.

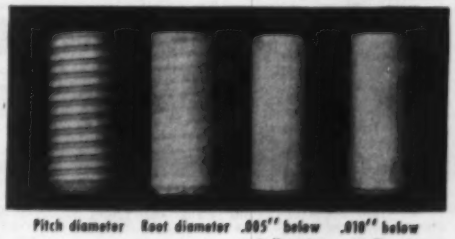
Unbrako Set Screw



Pitch diameter Root diameter .005" below root diameter .010" below root diameter

Fully formed threads make the whole screw stronger. The metal is compressed into a closely knit grain structure. The grain flow follows the contour of the threads. The UNBRAKO retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

Ordinary Set Screw



Pitch diameter Root diameter .005" below root diameter .010" below root diameter

STANDARD PRESSED STEEL CO.

UNBRAKO SOCKET SCREW DIVISION SPS JENKINTOWN PENNSYLVANIA

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.2; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80; No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.50, New York, duty paid, 10.000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom smelters, 45.50 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom, per troy oz.

Lead: Common, 15.30, chemical, 15.40, corroding, 15.40, St. Louis, New York basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig, 32.50; notched ingot, 33.25, 10.000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10.000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $278-$283 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.25 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "P" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $91-$97 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $9-$10 per lb.

Silver: Open market, 91.625 per troy oz.

Sodium: 16.50, e.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 96.375; prompt, 96.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.95, grade A-2 (0.5% Fe max), $3.50 per pound.

Tungsten: Powder, 98.8%, carbon, reduced, 1000-lb lots, $4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 13.00; brass special, 13.25; intermediate, 13.50. East St. Louis, freight allowed over 0.50 per pound. High grade, 14.35; special high grade 14.50-14.75, deld. Diecasting alloy ingot No. 3, 17.50-17.75; No. 2, 18.50-18.75; No. 5, 18.00-18.25, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $10 per lb. Powder electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 31.50-33.50; No. 12 foundry alloy (No. 2 grade) 30.50-30.75; 5% silicon alloy, 0.60 Cu max, 32.00-32.75; 13 alloy, 0.60 Cu max, 32.00-32.75; 195 alloy, 32.00-32.75; 108 alloy, 30.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 31.25-32.25; grade 2, 30.25-31.25; grade 3, 29.50-30.50; grade 4, 29.00-30.00.

Brass Ingot: Red brass No. 115, 41.00; tin bronze No. 225, 54.00; No. 245, 47.25; high-leaded tin bronze No. 305, 44.75; No. 1 yellow No. 405, 32.75; manganese bronze No. 421, 36.25.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21 per cwt; pipe, full coils, $21 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10 000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.50; plates 19.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes H.R.	87	74	93
Seamless Tubes	122	110	153
Shot, Blocks		71	

ALUMINUM

Screw Machine Stock: 30.000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4		
0.156-0.172	57.5	55.9		
0.188	57.5	55.9		71.7
0.219-0.234	54.5	52.9		
0.250-0.281	54.5	52.9		68.4
0.313	54.5	52.9		65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1		52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9		
1.625-2.000	48.2	46.2		50.5
2.125-2.500	47.0	45.0		
2.563-3.375	45.6	43.6		

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30.000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	37.5	42.3		
0.135-0.096	38.0	43.2		
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.8	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.030	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.6
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0		39.4	45.4
0.016-0.015	43.9		40.2	46.6
0.014	44.9		41.2	47.9
0.013-0.012	46.1		41.9	48.9
0.011	47.1		43.1	50.5
0.010-0.0095	48.4		44.3	52.2
0.009-0.0085	49.7		45.8	54.3
0.008-0.0075	51.3		47.0	56.1
0.007	52.8		48.5	58.4
0.006	54.4		49.9	63.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam. 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.10, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90.000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in., 99c; 0.064 in., 78.00c; 0.125 in., 63.50c, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00c, 30.000 lb or more, 0.250 in. and over, widths 24-60 in., lengths 72-180 in.; tread plate, 64.00c, 30.000 lb or more, ¼-in. thick, widths 24-60 in., lengths 60-192 in.; tooling plate, 66.00c, 30.000 lbs or more, .250-3.000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, ¼ x 2 in., 64.70c; 1 x 4 in., 69.50c. Rod, 1 in., 61.50c; 2 in., 59.00c. Tubing, 1 in. OD x 0.065 in., 82.50c; Angles, 1 x 1 x ⅛-in., 68.40c; 2 x 2 x ¼-in., 62.50c. Channels, 5 in., 63.40c. I-beams, 5 in., 62.70c.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 19.50; old sheets, 16.50-17.00; borings and turnings, 11.00; crankcases, 16.50-17.00; industrial castings, 16.50-17.50.

Copper and Brass: No. 1 heavy copper and wire, 35.50-36.00; No. 2 heavy copper and wire, 34.00-34.50; light copper, 31.50-32.00; No. 1 composition red brass, 28.00-29.00; No. 1 composition turnings, 27.00-28.00; yellow

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	62.76b	60.36c	....	62.82	39.000	39.000	38.250
Yellow Brass	52.27	42.41d	52.81	55.18	28.875	28.625	26 750
Red Brass, 85%	58.09	58.03	58.63	60.90	34.250	34 000	33.500
Low Brass, 80%	56.55	56.49	57.09	59.36	32.750	32 250	31 750
Naval Brass	55.63	49.94	62.69	58.79	26.750	26 500	26 000
Com. Bronze, 90%	60.18	60.12	60.72	62.74	35.750	35.500	35 000
Nickel Silver, 10%	68.00	68.33g	68.33	....	32.500	32.250	16 250
Phos. Bronze, A, 5%	80.99	81.49	81.49	82.67	39 250	39 000	38.000
Silicon Bronze	66.54	65.73	66.58	65.68e	37.625	37 375	36.875
Manganese Bronze	59.37	53.38	63.82	....	27.000	26 750	25 750
Muntz Metal	53.74	49.55	....	....	27.000	26.750	26.250

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20 000 lb. f.o.b. shipping point. On lots over 20.000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Brass turnings, 15.50-16.00; new brass clippings, 25.00-25.50; light brass, 17.00-17.50; heavy yellow brass, 19.50-20.00; new brass rod ends, 23.50-24.00; auto radiators, unsweated, 23.00-23.50; cocks and faucets, 23.00-23.50; brass pipe, 23.00-23.50.

Lead: Heavy, 12.00-12.50; battery plates, 6.50-7.00; linotype and stereotype, 14.00-14.75; electrotype, 12.00-12.75; mixed babbitt, 14.50.

Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 54.50-60.00; old sheets, 45.00-50.00; turnings, 44.00; rods, 54.50-60.00.

Nickel: Sheets and clips, 90.00-125.00; rolled anodes, 90.00-125.00; turnings, 75.00-100.00; rod ends, 90.00-125.00.

Zinc: Old zinc, 5.50-6.00; new die-cast scrap, 5.00-5.75; old die-cast scrap; 3.50-4.00.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 22.50; 3003 clippings, 22.25-22.50; 6151 clippings, 22.00-22.50; 5052 clippings, 22.00-22.50; 2014 clippings, 21.50; 2017 clippings, 21.50; 2024 clippings, 21.50; mixed clippings, 21.50-22.00; old sheet, 19.00; old cast, 19.00-20.00; clean old cable (free of steel), 22.00-22.50; borings and turnings, 19.00-20.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 65.00; light scrap, 60.00; turnings and borings, 43.00-55.00.

Copper and Brass: No. 1 copper and wire, 39.00; No. 2 copper and wire, 37.50; light copper, 35.00-35.25; refinery brass (60% copper) per dry copper content, 35.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper and wire, 39.00; No. 2 copper and wire, 37.50; light copper, 35.00-35.25; No. 1 composition borings, 31.50; No. 1 composition solids, 32.00-32.50; heavy yellow brass solids 22.00; yellow brass turnings, 21.00; radiators, 24.50-25.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.42, oval, 58.92, 5000-10,000 lb; electrodeposited, 56.78, 2000-5000 lb lots; cast 62.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.145; 200-499 lb, $1.13; 500-999 lb, $1.125; 1000 lb or more, $1.12.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 29.50; 10,000 lb and over, 28.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 3300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 16-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

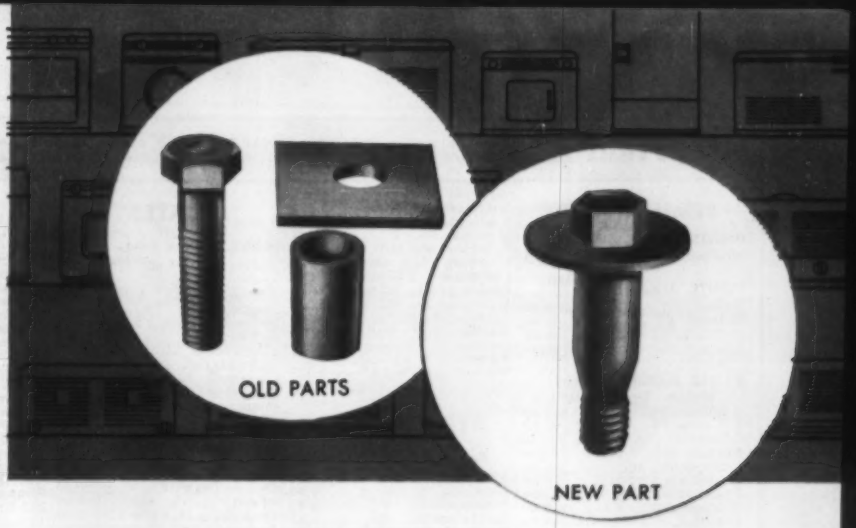
Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.50; 100-600 lb, 58.10; 700-1900 lb, 55.70; 2000-9900 lb, 53.90; 10,000 lb or more, 52.80.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.588; 50 lb, $1.248; 100-300 lb, $1.098; 400-900 lb, $1.074; 1000-1900 lb, $1.049; 2000-4900 lb, $1.013; 5000-19,900 lb, 95.20; 20,000 lb or more, 89.10.

Stannous Sulphate: Less than 50 lb, $1.287; 50 lb, 98.70; 100-1900 lb, 96.70; 2000 lb or more, 94.70.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.



This Special Townsend Part Does Work of Three—Saves Appliance Manufacturer $25,000 Per Year

Some time ago when studying the assembly methods of a large appliance manufacturer, a Townsend engineer made an important discovery. He found that three separate parts—bolt, square washer and spacer, shown above, were being used in a critical assembly.

The three parts were assembled by hand and then brazed to form a single unit. This was a slow, costly operation. Further, the three parts tripled the inventory work.

This engineer felt that Townsend's more than a century of cold-heading experience could be used to develop one part which would do the job. It was difficult because of the large volume of metal which had to be upset to form the bolt head, spacer and washer in one piece. After that problem was solved, the thread rolling and heat treating operations were routine.

The result—this manufacturer uses so many of these that it will mean a savings of approximately $25,000 per year in material costs, reduced assembly time, and simplified inventory.

This is but one example of how Townsend engineers work with designers and production engineers to give them advice which makes possible improvements in their products, reduced material costs and lower assembly time.

To learn how their services and Townsend's ten thousand different types of fasteners and small parts can give you more economical production, write or use the coupon below.

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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers *following* mill points indicate producing company. Key on page 95. Key to footnotes, page 97.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)
Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall,Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ...$68.50
Bessemer,Pa. U5 .....68.50
Bridgeport,Conn. N19..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 ....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 .....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 ....74.50
Munhall, Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5..68.50
S.Duquesne,Pa. U5 ...68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 .....84.50
Bridgeport,Conn. N19..89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3..89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana, Calif. K1 ....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houton S5 .....89.50
Johnstown,Pa. B2 .....84.50
Lackawanna,N.Y. B2..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 ...96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ...96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ...103.50
S.Duquesne,Pa. U5 ...103.50

SKELP
Aliquippa,Pa. J5 ....4.325
LoneStar,Tex. L6 ....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS
AlabamaCity,Ala. R2 ..5.025
Aliquippa,Pa. J5 .....5.025
Alton,Ill. L1 .....5.20
Buffalo B11, W12 ....5.025
Cleveland A7 .....5.025
Donora,Pa. A7 .....5.025
Fairfield,Ala. T2 .....5.025
Houston S5 .....5.275
IndianaHarbor,Ind. Y1..5.025
Johnstown,Pa. B2 ....5.025
Joliet,Ill. A7 .....5.025
KansasCity,Mo. S5 ...5.275
Kokomo,Ind. C18 ....5.125
LosAngeles B3 .....5.825
Minnequa,Colo. C10 ...5.275
Monessen,Pa. P7 .....5.025
N.Tonawanda,N.Y. B11..5.025
Pittsburg,Calif. C11 ...5.675
Portsmouth P12 .....5.025
Roebling,N.J. R5 .....5.125
S.Chicago,Ill. R2 .....5.025
SparrowsPoint,Md. B2..5.125
Sterling,Ill.(1) N15 ....5.025
Sterling,Ill. N15 .....5.125
Struthers,O. Y1 .....5.025
Worcester,Mass. A7 ...5.325

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala. T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....4.60
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 .....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 .....4.65
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 ....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 ....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 ....4.60

Wide Flange
Bethlehem,Pa. B2 .....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 ....5.40
Lackawanna,N.Y. B2 ...4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes
Clairton,Pa. U5 .....5.65
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....5.65
Houton S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S, L.A. Std. Shapes
Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1..6.75
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....6.85
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 ....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.80
Lackawanna,N.Y. B2 ..6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.80
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 .....4.80
Conshohocken,Pa. A3 ..4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 ....4.70
Harrisburg,Pa. C5 ....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1..4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ..4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.50
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14..4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 ....4.50
Youngstown R2, U5, Y1..4.50

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....5.65
Fontana,Calif. K1 ....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ....10.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.725
Bessemer,Ala. T2 .....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Claymont,Del. C22 .....6.725
Coatesville,Pa. L7 .....6.725
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1 .7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
LosAngeles B3 .....7.625
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14..6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy
Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 ....6.30
Coatesville,Pa. L7 ....6.30
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES
Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. C5 .....5.575
Ind.Harbor,Ind. I-2 ....5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron
Ashland c.l. (15) A10...4.75
Ashland l.c.l. (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.65
Aliquippa,Pa. J5 .....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala. T2 .....4.65
Birmingham C15 .....4.65
Bridgeport,Conn. N19 ..4.80
Buffalo R2 .....4.65
Canton,O. R2 .....4.75
Clairton,Pa. U5 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ....4.80
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 .....4.65
Houston S5 .....4.90
Ind.Harbor,Ind. I-2, Y1..4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
Los Angeles B3 .....5.35
Massillon,O. R2 .....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.65
Pittsburg,Calif. C11 ...5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago R2, U5, W14..4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Warren,O. R2 .....4.65
Weirton,W.Va. W6 ....4.65
Youngstown R2, U5 ....4.65

BARS, H.R. Leaded Alloy
Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.575
Bridgeport,Conn. N19 ..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 ....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 ....6.625
FairlessHills,Pa. U5 ...5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2,Y1..5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 ....5.825
Lackawanna,N.Y. B2 ...5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago, R2, U5, W14..5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.S. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 ....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1 ..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....7.05
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 ....6.80
S.SanFrancisco B3 ....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 ....5.90
Youngstown U5 .....5.65

BARS, C.F. Leaded Alloy
Ambridge,Pa. W18 ....8.325
Camden,N.J. P13 .....8.50
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 ....8.50
Warren,O. C17 .....8.325

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.90
BeaverFalls,Pa. M12, R2 5.90
Buffalo B5 .....5.95
Camden,N.J. P13 .....6.35
Carnegie,Pa. C12 .....5.90
Chicago W18 .....5.90
Cleveland A7, C20 ....5.90
Detroit R7 .....5.90
Detroit B5, P17 .....6.10
Donora,Pa. A7 .....5.90
Elyria,O. W18 .....5.90
FranklinPark,Ill. N5 ...5.90
Gary,Ind. R2 .....5.90
GreenBay,Wis. F7 ....5.90
Hammond,Ind. L2, M13..5.90
Hartford,Conn. R2 ....6.40
Harvey,Ill. B5 .....5.90
LosAngeles R2, S30 ....7.35
Mansfield,Mass. B5 ....6.45
Massillon,O. R2, R8 ....5.90
Midland,Pa. C18 .....5.90
Monaca,Pa. S17 .....5.90
Newark,N.J. W18 .....6.35
NewCastle,Pa.(17) B4 ..5.90
Pittsburgh J5 .....5.90
Plymouth,Mich. P5 ....6.15
Putnam,Conn. W18 ....6.45
Readville,Mass. C14 ....6.45
S.Chicago,Ill. W14 ....5.90
SpringCity,Pa. K3 ....6.35
Struthers,O. Y1 .....5.90
Waukegan,Ill. A7 .....5.90
Worcester,Mass. W19 ..6.35
Youngstown F3, Y1 ....5.90

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. C19 ....5.15

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa.M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 ....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay,Wis. F7 .....7.425
Hammond,Ind. L2, M13..7.425
Hartford,Conn. R2 ....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ..7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ....7.725
Massillon,O. R2, R8 ....7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 ....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 .....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ...7.725
Youngstown F3, Y1 ....7.425

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....4.65
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ....4.80
Fontana,Calif. K1 .....5.35
Ft.Worth,Tex.(42) T4 ..5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1..4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5, Y1..4.65

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ..6.17
Marion,O. P11 .....5.90
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ¼-1" B2..6.15
Williamsport,Pa. S19 ..6.00

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.55
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth, Tex.(26) T4 ..4.95
Franklin,Pa.(3) F5 ....4.55
Franklin,Pa.(4) F5 ....4.65
Marion,O.(3) P11 .....4.50
Moline,Ill.(3) R2 .....4.65
Tonawanda(3) B12 ....4.50
Tonawanda(4) B12 ....4.65
Williamsport,Pa(3) S19..4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14 14.65
McK.Rks.(S.R.) L5 ...11.50
McK.Rks.(D.R.) L5 ...16.00
McK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ..4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ...4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
FairlessHills,Pa. U5 ...4.375
Fontana,Calif. K1 ....5.075
Gary, Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1..4.325
Kokomo,Ind. C16 .....4.425
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6, (37)..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ...4.325
Niles,O. N12 .....4.325
Pittsburg,Calif. C11...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 .....4.325
Riverdale,Ill. A1 .....4.325
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
SparrowsPoint,Md. B2..4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ..4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Kokomo,Ind. C16 ....5.475
Niles,O. N12 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R.(14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
FairlessHills,Pa. U5 ...6.425
Fontana,Calif. K1 ....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2..6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1....6.375

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky. (8) A10 ..4.575
Cleveland R2 .....4.925
Ind.Harbor,Ind. I-2 ...4.575
Warren,O. R2 .....4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
FairlessHills,Pa. U5 ..5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.525
Ind.Harbor,Ind I-2, Y1 5.325
Lackawanna,N.Y. B2..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 .....5.325
Newport,Ky. N9 .....5.325
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.975
FairlessHills,Pa. U5 ...7.925
Fontana,Calif. K1 ....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1..7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.925
Middletown,O. A10 ....5.825
Warren,O. R2 .....5.925

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.90	...
Canton,O. R2	6.10	6.55
Dravosburg U5	6.10	...
Fairfield T2	6.10	...
Gary,Ind. U5	6.10	6.35
Ind.Harbor I-2	6.10	6.35
Kokomo,Ind. C16	6.20	...
MartinsFry. W10	6.10	...
Newport,Ky. N9	6.10	6.35
Pitts.,Calif. C11	6.85	...
SparrowsPt. B2	6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry,O. W10 ....6.35

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 ....5.85†
Ashland,Ky. A10 .....5.85†
Canton,O. R2 .....5.85‡
Delphos,O. N16 .....6.60‡
Dover,O. R1 .....5.85‡
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity,Ill. G4 ....6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Niles,O. N12 .....6.85‡
Pittsburg,Calif. C1 ....6.60*
SparrowsPt.,Md. B2 ...5.85†
Steubenville,O. W10 ...5.85‡
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ....5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25
Niles,O. N12 .....7.25

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Canton,O. R2 .....6.60
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1)..8.50
Butler,Pa. A10 (type 2)..8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. N12 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. N12 .....6.25
Weirton,W.Va. W6 .....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....6.65

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Division H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div. Sharon Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel &Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div. U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Alienport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.325
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.075
Gary,Ind. U5	4.325
Ind.Harbor, Ind.I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
NewBritain(10) S15	4.325
N.Tonawanda,N.Y. B11	4.325
Pittsburg,Calif. C11	5.075
Portsmouth,O. P12	4.325
Riverdale,Ill. A1	4.325
SanFrancisco S7	5.05
Seattle(25) S3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren.O. R2	4.325
Weirton W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.525
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2, Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren.O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575
Warren.O. R2	4.925

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland J5	6.25
Cleveland A7	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. P4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.50
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7	7.00
NewHaven,Conn. D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Portsmouth,O. P12	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren.O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	7.10
Youngstown Y1	6.25
Youngstown C8	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61-0.80C**	**0.81-1.05C**	**1.06-1.35C**
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol,Conn. W1	...	...	10.80	12.95	15.65
Carnegie,Pa. S18	...	8.95	10.50	12.65	....
Cleveland A7	7.00	8.95	10.50	12.65	15.35
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.10	9.05	10.60	....	....
Detroit D2	7.10	9.05	10.60	12.75	....
Dover,O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee,W.Va. P4	7.00	8.95	10.50**	....	....
FranklinPark,Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison,N.J. C18	...	...	10.60	12.95	15.65
Indianapolis C8	7.15	9.10	10.50	12.65	15.35
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4, E5	7.00	8.95	10.50	12.65	....
NewHaven,Conn. D2	7.45	9.25	10.80	12.95	....
NewKensington,Pa. A6	7.00	8.95	10.50	....	....
New York W3	...	9.25	10.80	12.95	15.65
Pawtucket,R.I. N8	7.55	9.25	10.80	12.95	15.35
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton,N.J. R5	...	9.25	10.80	12.95	15.65
Wallingford,Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren.O. T5	7.00	8.95	10.50	12.65	15.35
Weirton,W.Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester,Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester,Mass. A7	7.85	9.25	10.80	12.95	15.65
Youngstown C8	7.00	8.95	10.50	12.65	15.35

**0.065 C, max.

Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	14.75	17.95	21.35

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.55*
Youngstown C8	6.25*
Warren.O. T5	6.25*
Warren.O. B9	6.45*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	7.10*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	**Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. N12	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren.O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	**Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	....	....	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren.O. R2	8.60†	10.10	10.70	11.70	12.60
Zanesville,O. A10	....	10.10	10.70	11.70	12.60

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	**T-72**	**T-65**	**T-58**	**T-52**
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	**Grain Oriented T-100**	**T-90**	**T-80**	**T-73**	**T-72**
Brackenridge,Pa. A4	....	15.85	17.45	17.95	13.55‡
Butler,Pa. A10	....	....	17.45	17.95	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren.O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¼-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	**0.25 lb**	**0.50 lb**	**0.75 lb**
Aliquippa,Pa. J5	$7.90	$8.15	$8.55
Dravosburg,Pa. U5	7.90	8.15	8.55
Fairfield,Ala. T2	8.00	8.25	8.65
FairlessHills,Pa. U5	8.00	8.25	8.65
Gary,Ind. U5	7.90	8.15	8.55
GraniteCity,Ill. G4	8.00	8.25	8.65
Indiana Harbor,Ind. I-2, Y1	7.90	8.15	8.55
Niles,O. R2	7.90	8.15	8.55
Pittsburg,Calif. C11	8.85	8.90	9.30
SparrowsPoint,Md. B2	8.00	8.25	8.65
Weirton,W.Va. W6	7.90	8.15	8.55
Yorkville,O. W10	7.90	8.15	8.55

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.575	....	....
Niles,O. R2	7.075	7.275	7.475

TINPLATE, American Coke (Base Box)	**1.25 lb**	**1.50 lb**
Aliquippa,Pa. J5	$9.20	$9.45
Dravosburg,Pa. U5	9.20	9.45
Fairfield,Ala. T2	9.30	9.55
Fairless,Pa. U5	9.30	9.55
Gary,Ind. U5	9.20	9.45
Ind.Har. I-2, Y1	9.20	9.45
Pitts.,Calif. C11	9.95	10.20
Sp.Pt.,Md. B2	9.30	9.55
Weirton,W.Va. W6	9.20	9.45
Yorkville,O. W10	9.20	9.45

BLACK PLATE, (Base Box)	
Aliquippa,Pa. J5	$7.00
Dravosburg,Pa. U5	7.00
Fairfield,Ala. T2	7.10
FairlessHills,Pa. U5	7.10
Gary,Ind. U5	7.00
GraniteCity,Ill. G4	7.10
Ind.Harbor,Ind. I-2, Y1	7.00
Niles,O. R2	7.00
Pittsburg,Calif. C11	7.75

SparrowsPoint,Md. B2	7.10
Warren.O. R2	7.00
Weirton,W.Va. W6	7.00
Yorkville,O. W10	7.00

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gary,Ind. U5	6.65
GraniteCity,Ill. G4	6.75
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	8.70
Gary,Ind. U5	8.70

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$9.15

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.25
Aliquippa,Pa. J5	6.25
Alton Ill. L1	6.425
Atlanta A11	6.45
Bartonville,Ill. K4	6.35
Buffalo W12	6.25
Chicago W13	6.25
Cleveland A7	6.25
Crawfordsville,Ind. M8	6.35
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fairfield,Ala. T2	6.25
Fostoria,O.(24) S1	6.45
Houston S5	6.50
Jacksonville,Fla. M8	6.77
Johnstown,Pa. B2	6.25
Joliet,Ill. A7	6.25
KansasCity,Mo. S5	6.50
Kokomo,Ind. C16	6.35
LosAngeles B3	7.20
Minnequa,Colo. C10	6.50
Monessen,Pa. P7	6.25
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.25
Palmer,Mass. W12	6.55
Pittsburg Calif. C11	7.20
Portsmouth,O. P12	6.25
Rankin,Pa. A7	6.25
S.Chicago,Ill. R2	6.25
S.SanFrancisco C10	7.20
SparrowsPoint Md. B2	6.35
Sterling,Ill.(1) N15	6.25
Sterling Ill. N15	6.35
Struthers,O. Y1	6.25
Waukegan Ill. A7	6.25
Worcester,Mass. A7	6.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton Ill. L1	8.075
Bartonville Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.45
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester,A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Jonnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa Colo. C10	7.775
Monessen,Pa. P16	7.60
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	7.90
Pittsburg Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	13.05
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P16	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan Ill. A7	12.55
Worcester,Mass.A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80

ROPE WIRE (A)

Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O.(23) S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead
Bartonville Ill K4 ....14.15
Monessen,Pa. P16 ....14.20
Roebling,N J. R5 ....14.35

WIRE, Cold-Rolled Flat
Anderson Ind. G6 .....9 00
Baltimore T6 .....9.30
Buffalo W12 .....9.00
Cleveland A7 .....9.00
Crawfordsville,Ind. M8..9 00
Dover O. G6 .....9 00
Fostoria,O. S1 .....9.00
FranklinPark,Ill. T6 ....9.10
Kokomo Ind. C16 .....9 00
Massillon,O. R8 .....9.00
Milwaukee C23 .....9 20
Monessen,Pa. P16 .....9 00
Pawtucket R.I. N8 ....9.30
Riverdale,Ill. A1 .....9.10
Rome,N.Y. R6 .....9.00
Trenton,N.J. R5 .....9.30
Worcester A7, T6, W12,9.30

NAIL, Stock
To Dealers & Mfrs. (7) Col.
AlabamaCity,Ala. R2 ...152
Aliquippa,Pa. J5 152
Atlanta A11 154
Bartonville,Ill. K4 154
Chicago,Ill. W13 152
Cleveland A9 157
Crawfordsville Ind. M8 ..154
Donora,Pa. A7 152
Duluth Minn. A7 152
Fairfield,Ala. T2 152
Galveston Tex. D7 157
Houston,Tex. S5 157
Johnstown,Pa. B2 152
Joliet Ill. A7 152
KansasCity,Mo. S5 157
Kokomo,Ind. C16 154
Minnequa Colo. C10 157
Monessen,Pa P7 152
Pittsburg Calif. C11 171
Rankin Pa. A7 152
S Chicago Ill R2 152
SparrowsPt.,Md. B2 154
Sterling,Ill (1) N15 152
Worcester,Mass. A7 158

NAILS, CUT (100 lb keg)
To Dealers (33)
Conshohocken,Pa. A3 ..$9 05
Wheeling,W Va. W10 ..9.05

STAPLES, Polished Stock
To Dealers & Mfrs. (7) Col.
Aliquippa Pa. J5 152
Atlanta A11 154
Bartonville Ill K4 154
Crawfordsville Ind. M8 ..154
Donora,Pa. A7 152
Duluth Minn. A7 152
Fairfield,Ala. T2 152
Johnstown,Pa. B2 152
Joliet Ill. A7 152
Kokomo Ind C16 154
Minnequa Colo. C10 157
Monessen,Pa. P7 152
Pittsburg Calif C11 171
Rankin,Pa. A2 152
SparrowsPt.,Md. B2 154
Sterling Ill (1) N15 152
Worcester,Mass. A7 158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)
Coil No 3150
AlabamaCity Ala R2 ..$9 35
Bartonville Ill. K4 .....9.45
Buffalo W12 .....9.35
Crawfordsville Ind. M8..9 46
Donora,Pa. A7 .....9 35
Duluth Minn. A7 .....9 35
Johnstown,Pa. B2 .....9 35
Joliet Ill. A7 .....9 35
Kokomo Ind C16 .....9 45
LosAngeles B3 .....10 14
Minnequa Colo C10 ....9 60
Pittsburg Calif C11 ....10 43
S Chicago Ill R2 .....9 35
SparrowsPt. Md. B2....9 45
Sterling Ill N15 .....9.35

Coil No. 6300 Stand.
AlabamaCity,Ala. R2..$9.65
Bartonville Ill. K4 .....9.75
Buffalo W12 .....9.60
Crawfordsville,Ind. M8..9.75
Donora,Pa. A7 .....9.65
Duluth,Minn. A7 .....9.65
Johnstown,Pa. B3 .....9.65
Joliet,Ill. A7 .....9.65
Kokomo,Ind. C16 .....9.75
LosAngeles B3 .....10.45
Minnequa,Colo. C10 ....9.90
Pittsburg,Calif. C11 ...10.13
S.Chicago Ill R2 .....9.65
SparrowsPt.,Md. B2 ....9.75
Sterling,Ill. N15 .....9.65

Coil No. 6500 Interim
AlabamaCity Ala. R2 ..$9.70
Bartonville,Ill. K4 .....9.80
Buffalo W12 .....9.70
Crawfordsville,Ind. M8..9.80
Donora,Pa. A7 .....9.70
Duluth,Minn. A7 .....9.70
Johnstown,Pa. B2 .....9.70
Joliet,Ill. A7 .....9.70
Kokomo,Ind. C16 .....9 80
LosAngeles B3 .....10.50
Minnequa,Colo. C10 ...9 95
Pittsburg,Calif. C11 ...10.50
S.Chicago,Ill. R2 .....9.70
SparrowsPt.,Md. B2 ...9 80
Sterling,Ill. N15 .....9.70

WIRE, Barbed **Col.**
AlabamaCity,Ala. R2..175**
Aliquippa J5 .....172§
Atlanta A11 181
Bartonville,Ill. K4 181
Crawfordsville,Ind. M8 ..181
Donora,Pa. A7 .....175†
Duluth Minn. A7 .....175†
Fairfield,Ala. T2 .....175†
Houston Tex. S5 .....180†
Johnstown,Pa. B2 ....179*
Joliet,Ill. A7 .....175†
KansasCity,Mo. S5 ....180†
Kokomo,Ind. C16 .....177†
Minnequa Colo. C10 ...180**
Monessen,Pa. P7 .....179*
Pittsburg,Calif. C11 ...195†
Rankin Pa. A7 .....175†
S.Chicago,Ill. R2 ....175**
S.SanFrancisco C10 ...195**
SparrowsPoint,Md. B2 ..181*
Sterling,Ill.(1) N15 ....179*

WOVEN Fence, 9-15 Ga. Col
Ala.City,Ala. R2 .....162**
Ala.City, 17 ga. R2 ...241**
Ala.City, 18 ga. R2 ...251**
Aliq'ppa,Pa.9-14½ga J5 165†
Atlanta A11 168
Bartonville Ill. K4 168
Crawfordsville,Ind. M8 ..168
Donora,Pa. A7 .....162†
Duluth Minn. A7 .....162†
Fairfield,Ala. T2 .....162†
Houston,Tex. S5 .....167†
Johnstown,Pa.(43) B2 ..166
Joliet,Ill. A7 .....162†
KansasCity Mo. S5 ....167†
Kokomo,Ind. C16 .....164†
Minnequa Colo. C10 ....167**
Monessen Pa. 9 ga. P17 166*
Pittsburg,Calif. C11 ...185†
Rankin,Pa. A7 .....162†
S Chicago Ill R2 .....162**
Sterling,Ill.(1) N15 ....166*

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14 60	16.50
Buffalo W12	14 50	....
Cleveland A7	14 50	....
Crawf'dsville M8	14.60	16 50
Fostoria,O. S1	14 60	16.15†
Johnstown B2	14 15	16 10*
Kokomo C16	14 60	16.15†
Minnequa C10	14.75	16 45**
Palmer,MassW12	14 50	16.05*
Pitts.,Calif. C11	14 95	16.40†
S.Chicago R2	14 50	16.05**
SparrowsPt. B2	14 60	16.50*
Sterling(1) N15	14 50	16.45††
Waukegan A7	14.50	16.05†
Worcester A7	14.80	....

WIRE, Merchant Quality
(6 to 8 gage) An'ld Galv.
Ala.City,Ala. R2..7.40 7.80**
Aliquippa J5 ....7.50 7.90§
Atlanta A11 .....7.50 8.075
Bartonville(48) K4 7.50 8.075
Buffalo W12 .....7.40 8.80*
Cleveland A7 .....7.40 ....
Crawfordsville M8 7.50 8.075
Donora,Pa. A7 ....7.40 7.80†
Duluth Minn. A7..7.40 7.80†
Fairfield T2 .....7.40 7.80†
Houston,Tex. S5 ..7.65 8.05†
Jacks'ville,Fla.M8. 7.90 8.475
Johnstown B2(48) 7.40 7.975*
Joliet,Ill. A7 .....7.40 7.80†
KansasCity,Mo. S5 7 65 8.05†
Kokomo C16 .....7.50 7.90†
LosAngeles B3 ..8.35 8.925*
Minnequa C10 ...7.65 8.05**
Monessen P7 (48)7.40 7.975*
Palmer Mass. W12 7.70 8.10*
Pitts.,Calif. C11 ..8.35 8.75*
Portsmouth O. P12 7.40 ....
Rankin A7 .....7.40 7.80*
S Chicago R2 ....7.40 7.80**
S.SanFran. C10 .8.35 8.75**
SparrowsPt.B2(48) 7.50 8.075*
Stirling(1)(48)N15 7.40 8.00††
Struthers,O.(48)Y1 7.40 7.90§
Worcester,Mass.A7 7.70 ....

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FASTENERS
(Base discounts, full case quantity, per cent off list to consumer)

Carriage, Machine Bolts
Full-Size Body (Cut thread)
†½" x 6" and smaller 61
Larger than ½" diam. and all diams. longer than 6" 55
Under-size body (Rolled thread); not nutted:
½" x 6" and smaller. 61
Carriage, Machine & Lag Hot Galvanized:
½" and smaller 42
Larger than ½" diam. and all diams. longer than 6" 32

†½" x 4" and smaller and shorter are not nutted.

Lag Bolts
All diams. x 6" and shorter 61
All diams. longer than 6" 55
Plow, Tap & Blank Bolts
½" x 6" and smaller. 61
Larger than ½" diam. and all diams. longer than 6" 55
Ribbed Neck, Carriage, Step, Elevator, Fitting-Up Bolts and Tire Bolts:
All sizes 61

NUTS
Reg. & Heavy Square Nuts, all sizes
H.P. Reg. & Heavy Hex Nuts:
⅝" & smaller 64
⅝" to 1⅛" incl. 63
1⅛" to 1½" incl. 65
1½" & larger 61
C.P. Reg. & Heavy Hex Nuts
⅝" & smaller 64
⅝" & larger 61
Semi-finished & Finished Nuts
⅝" & smaller 66
⅝" & larger 63
Hot Galvanized Nuts, all types
1½" & smaller 44

CAP SCREWS
(New Std., hexagon head, upset, packages)
Bright:
¼" through ½" diam. x 6" & shorter.... 34
⅝" & ¾" diam. x 6" & shorter 31
⅞", 1", 1⅛" x 6" & shorter 8
1¼" through 1½" diam. longer than 6" 3
1¾" through 2" diam. longer than 6" ....+13
High Carbon, heat-treated:
¼" through ½" diam. x 6" & shorter 20
⅝" & ¾" diam. x 6" & shorter 16
⅞", 1", 1⅛" x 6" & shorter +11
1¼" through 1½" diam. longer than 6" ....+23
1¾" through 2" diam. longer than 6" ....+41
(New Std. Hexagon head, upset, bulk)
Bright:
¼" x 6" & smaller & shorter 49
⅝" & ¾" diam. x 6" & shorter 48
⅞", 1", 1¼" x 6" & shorter 31
High Carbon, heat-treated:
¼" x 6" & smaller & shorter 41
⅝" x ¾" diam. & 6" & shorter 39

BOILER TUBES
Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.41
1¼	13	....	24.94	20.14
1½	13	23.31	27.57	22.60
1¾	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.59
2¾	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.54

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	...	5.65
Fairfield,Ala. T2	....	....	...	5.65
Gary,Ind. U5	4.725	...	...	...
Huntington W.Va. W7	....	....	....	5.65
Indiana Harbor,Ind. I-2	4.725	4.625	4.675	...
Johnstown,Pa. B2	....	....	...	(16)5.65
Lackawanna,N.Y. B2	4.725	4.625	...	5.65
Minnequa,Colo. C10	4.725	4.625	...	6.15
Steelton,Pa. B2	4.725	4.625	...	...
Williamsport,Pa. S19	....	....	...	5.65

TIE PLATES
Fairfield,Ala. T2 .....5.625
Gary,Ind. U5 .....5.625
Ind.Harbor,Ind. I-2 ....5.625
Lackawanna,N.Y. B2 ..5.625
Minnequa,Colo. C10 ...5.625
Seattle B3 .....5.775
Steelton,Pa. B2 .....5.625
Torrance,Calif. C11 ...5.775

TRACK BOLTS (20) Treated
Cleveland R2 .....12.40
KansasCity,Mo. S5 ....12.40
Lebanon,Pa. B2 .....12.40
Minnequa,Colo. C10 ...12.40
Pittsburgh O3, P14 ....12.40
Seattle B3 .....12.90

AXLES
Ind.Harbor,Ind. S13 ....7.25
Johnstown,Pa. B2 .....7.25

JOINT BARS
Bessemer Pa. U5 .....5.825
Fairfield,Ala. T2 .....5.825
Ind.Harbor,Ind. I-2 ...5.825
Joliet,Ill. U5 .....5.825
Lackawanna,N.Y. B2 ..5.825
Minnequa,Colo. C10 ...5.825
Steelton,Pa. B2 .....5.825

SCREW SPIKES
Cleveland R2 .....11.90
Pittsburgh O3 .....11.90

STANDARD TRACK SPIKES
Fairfield,Ala. T2 .....7.90
Ind.Harbor,Ind. I-2, Y1 7.90
KansasCity,Mo. S5 ....7 90
Lebanon,Pa. B2 .....7 90
Minnequa,Colo. C10 ....7 90
Pittsburgh J5 .....7.90
Seattle B3 .....8 40
S.Chicago,Ill. R2 .....7 90
Struthers,O. Y1 .....7.90
Youngstown R2 .....7.90

METAL POWDER
(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed.	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. Camden, N. J., c.l. in bags.	9.50
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ¼ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Atomized, 500 lb drum, frght. allowed	
Carlots	34.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots .....38.00-50.00†	
Bronze, 5000-lb lots .....61.50-64.75†	
Copper:	
Electrolytic	59.00
Reduced	59.00
Lead	24.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed ...	94.00
Nickel-Silver, 5000-lb lots	58.75-62.75†
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302...	94.00
Stainless Steel, 316...	$1.25
Tin 14.50*	
Zinc, 5000-lb lots 18.75-32.50†	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over...	4.50
Less than 1000 lb..	4.65
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 30% Zn. 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.8c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) Mild plow, 10.55c.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.10c.
(27) Bar mill zinc.
(28) Bond-rized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.10c for alloy and 0.45c H.S. & A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.80c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Youngstown Y1	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Alton, Ill. L1	...	...	....	....	....	....	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Benwood, W. Va. W10	16.5	+12	7.25	+18.25	+1.75	+26.25	17.5	0.25	20.5	4.75	23	7.75	25.5	7
Butler, Pa. P6	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Fairless Hills, Pa. N3	...	...	....	....	....	....	15.5	+1.75	18.5	2.75	21	5.75	23.5	7
Fontana, Calif. K1	...	...	....	....	....	....	6	+11.25	9	+7.25	11.5	+3.75	14	+2.5
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Lorain, O. N3	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sharon, Pa. B4	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sparrows Pt., Md. B2	15.5	+13	7	+18.5	+1.5	+26	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Youngstown R2, Y1	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Wheatland, Pa. W9	17.5	+11	9	+16.5	0.5	+24	17.5	0.25	20.5	4.25	23	7.75	25.5	9

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	....	...	....	...
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	16.5	+1.25	16.5	+1.25
Fontana, Calif. K1	14.5	+1.5	15	+1	16.5	+0.75	16.5	+0.75	7	+10.75	7	+10.75
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Sharon, Pa. M6	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Sparrows Pt., Md. B2	24	8	24.5	8.5	26	8.75	26	8.75	16.5	+1.25	16.5	+1.25
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Wheatland, Pa. W9	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	17.00	21.50	....	....	31.00	....	....	42.25	39.00
202	18.25	24.00	31.00	36.25	33.50	36.75	38.75	42.50	42.50
301	17.75	22.25	....	36.75	32.00	38.00	....	44.25	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	41.00	....	....	....
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	45.25	48.00	52.25	52.25
305	21.75	28.25	....	39.50	40.25	40.25	43.50	50.25	50.25
308	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00	52.00
309	29.50	35.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
314	....	....	....	....	....	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.75	63.25	65.75	69.25	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	34.00	36.25	....	44.00
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	31.00	....	....	....
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	31.50	....	....	....
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	....	....	35.50	40.50	53.25	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base—Cold Rolled, 10%	Strip, Carbon Base—Cold Rolled, Both Sides
Copper*	30.00	38.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular carbon	0.275	5%Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.875
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda,N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon,Mich. deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. C31	60.50	61.00	61.50	....
Philadelphia, deld.	62.16	62.66	63.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa,deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	60.66	60.66	61.16
Verona,Trafford, deld.	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer,Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	59.00	....
Sharpsville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	62.00	62.50	63.00	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$87.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$83.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	90.00
Keokuk, O.H. & Fdry, 12¼ lb piglets, 16% Si, frgt allowed K2	98.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Steelton,Pa. B2 (Phos. 0.035% max)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50

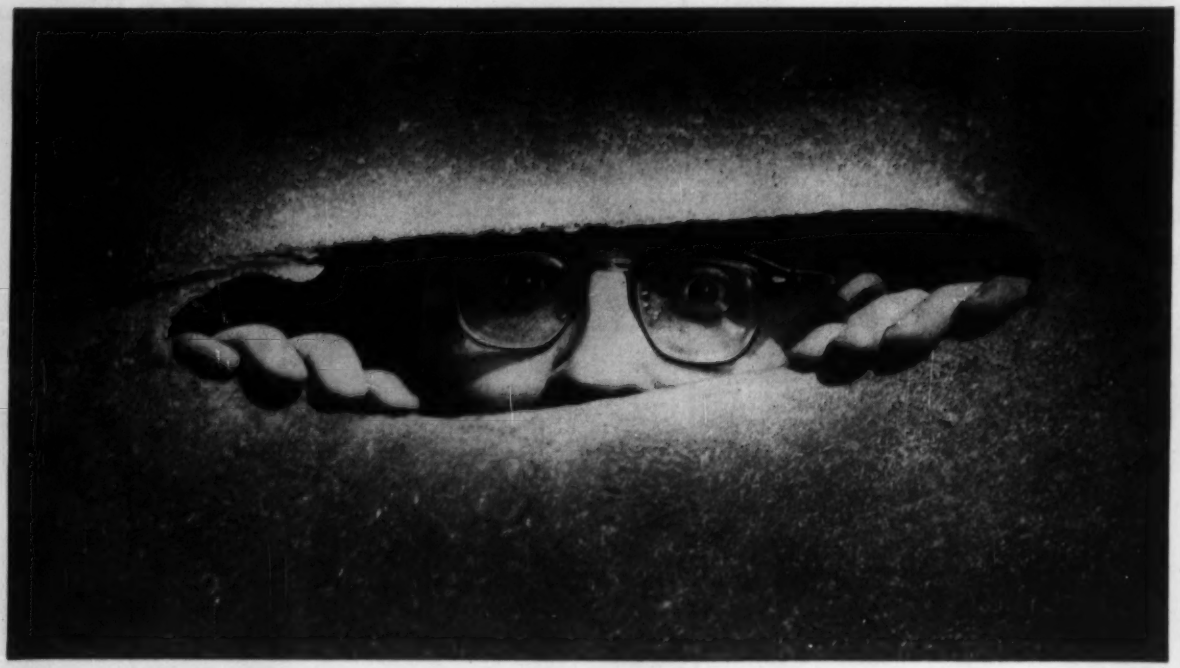
Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Buffalo, Cleveland, Erie, 30 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Chattanooga, Jackson, 15 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140†‡		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	...	7.42	9.39	....	7.63	7.49	9.48
Baltimore	7.03	8.32	8.37	....	7.65	...	7.61	8.62a	13.44	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	...	7.08	9.35	....	7.28	6.99	9.10
Boston	7.70	8.81	10.27	45.67	7.96	...	7.83	9.53	14.45	8.13	7.89	9.36
Buffalo	6.80	8.05	9.77	....	7.15	...	7.10	7.90	13.10	7.40	7.15	8.70
Chattanooga	6.95	8.10	8.60	....	7.20	...	7.20	9.18	....	7.45	7.25	9.05
Chicago	6.80	8.09	8.50	49.05	7.06	...	7.08	7.75	12.85	7.28	6.99	8.46
Cincinnati	6.92	8.08	8.90	46.10	7.30	...	7.32	8.05	13.09	7.75	7.28	8.71
Cleveland	6.80	8.09	8.85	49.16	7.16	...	7.14	7.85	12.91	7.61	7.16	8.63
Detroit	6.99	8.28	8.78	43.50	7.34	...	7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	6.80	7.90	8.85	....	7.15	...	7.08	7.85	....	7.40	7.15	8.63
Houston	7.85	8.75	10.49	....	8.15	...	8.25	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20	....	7.40	...	7.40	9.44	....	7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00	....	8.35	...	8.05	11.25	14.25	8.30	8.05	10.25
Milwaukee	6.89	8.18	8.59	....	7.15	...	7.17	7.94	12.94	7.45	7.08	8.55
Moline, Ill.	7.15	8.44	8.85	....	7.41	...	7.43	8.10	....	7.63	7.34	...
New York	7.46	8.68	9.44	44.95	8.07	...	7.96	9.48	13.28	7.99	7.76	9.19
Norfolk, Va.	7.25	...	...	....	7.65	...	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69**
Pittsburgh	6.80	8.09	9.20	49.00	7.16	...	7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65	....	8.00	...	7.95	12.20	15.00	7.85	7.75	9.66
Richmond, Va.	7.00	...	9.47	....	7.65	...	7.70	8.85	....	7.95	7.20	9.10
St. Louis	7.09	8.38	9.19	43.89	7.35	...	7.37	8.14	13.14	7.68	7.28	8.75
St. Paul	7.46	8.59	9.16	....	7.72	...	7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	...	8.05	11.20	14.25a	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	...	8.35	11.70	14.60	8.30	8.20	10.10
Spokane	8.55	11.00¶	10.80	....	9.05	...	8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	...	8.08	9.09	....	8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; a—500 to 9999 lb; b—400 to 999 lb; c—4000 lb and over; d—1000 to 1999 lb; e—1000 lb and over; f—1500 to 3999 lb; g—2000 to 3999 lb; h—f.o.b. local delivery in lots of 10,000 lb and over.



Looking for a TOUGHER STEEL?

Unusually tough, even at sub-zero temperatures, Lukens "T-1" steel can reduce equipment costs.

Failure from abrasion or from impact can happen to the steel in your equipment, too. Here's the answer—the tougher steel you've been looking for. Lukens "T-1" steel has excellent resistance to the combination of wear and impact, is tough enough to withstand unusual stresses and pressures as well as shock at either sub-zero or high temperatures, thus lowering maintenance costs and lengthening equipment life.

Equipment builders will find that the techniques of working with this new steel are no different than with carbon steel. Lukens "T-1" steel can be fabricated not only in the shop but also in the field, through proper design procedures. Because of its high yield strength (over 90,000 psi) this new steel offers lighter weight and reduced thickness in comparison to heavier, thicker plates of carbon steel, thereby reducing material, fabrication and shipping costs. And Lukens' range of steel plate sizes—including the widest and heaviest plates available anywhere—makes possible additional savings for equipment builders through the use of wider plates that require fewer welded seams.

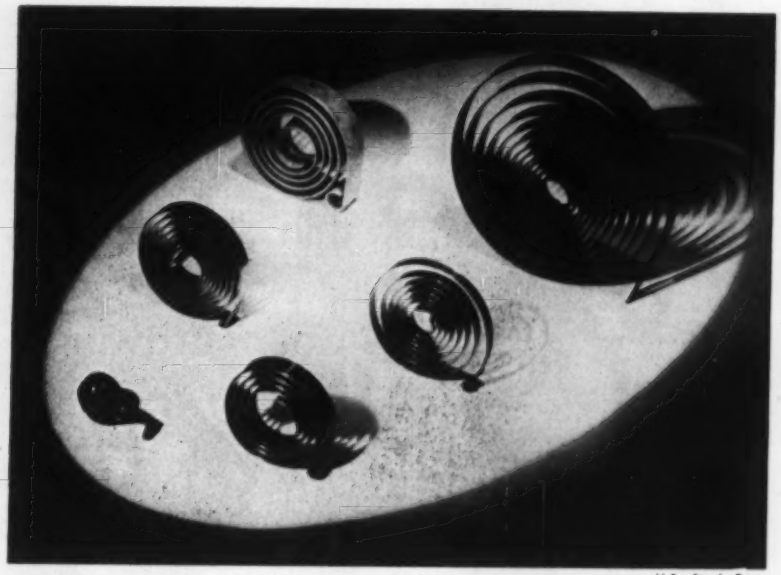
The latest addition to Lukens' complete line of carbon, alloy and clad steels, this quenched and tempered alloy plate steel's unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuilding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write for the new 28-page Bulletin 781. Address: Manager, Marketing Service, 773 Lukens Building, Lukens Steel Company, Coatesville, Pa.

LUKENS

"T-1" STEEL

THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA



U.S. Steel Corp.

Loss of big markets hasn't dampened their outlook as . . .

Springmakers Seek New Uses

PRODUCERS of flat springs rode high on the phonograph market until radios and electric phonographs came along. When automobile manufacturers turned from spring-type shock absorbers to hydraulic units, another market hit the skids. Another gave out when the hourglass figure was replaced by the natural lines of the female anatomy; springmakers lost a bulky order from the foundation garments industry.

Now another traditional user of flat springs—windup clocks—is losing ground. Electric clocks are coming to the fore. But, as usual, the industry is confident that new markets will come along to replace clocks or any other uses which fall by the wayside. In the long run, the flat spring industry will continue to grow at a rapid rate because every invention that involves a moving metal part is a potential user of its product.

Wide Range—There is no standard size for flat springs. They are tiny enough to run the most delicate watch and big enough to lift the heaviest overhead doors. This makes them a specialty product, and goes a long way in accounting for the industry's ability to absorb setbacks. They can be adapted to almost any potential application, resulting in thousands of uses.

Most producers try to keep a good balance in the application of their products so that loss of a market will not seriously hit their business. The automotive industry, which uses flat springs in transmissions, windows, distributors and many other places, is probably the largest customer. But one spring producer says: "We would starve if it were our only customer, so we limit it to half or less of our output." The company also makes springs for aircraft, clocks, toys, cameras and umbrellas.

Springs for Playtime—One of the most active markets now is the toy industry (STEEL, Oct. 10, p. 105). The Christmas season is the reason, of course. The increase of imports has had an adverse effect on this phase of the business, but springmakers are confident that the increase in the number of children, plus a greater per capita expenditure for toys, will offset imports.

Delivery time for springs generally has been extended because of today's good business. For toy springs, which do not require the close tolerances needed for clocks and watches, delivery is determined only by availability of raw materials. For the better quality, tempered springs, delivery time is as high as three months. This is a little more than twice the normal time. Practically all tempered flat spring strip is made from high-carbon (over 0.60 carbon) steel. Springmakers report that while they have had no real troubles getting sufficient supplies of this material, sometimes they have had to wait longer for it than they like.

Opening Doors—Because there is always the possibility of losing markets, the industry is continuously looking for new applications. One of the most fertile fields is electronics—radios, television sets, accounting machines, computers and other office business machines. There are plenty of potential markets, and the industry is confident of continued high-level production.

Wire . . .

Wire Prices, Pages 96 & 97

Wire mills generally are sold out for the remainder of this year on manufacturers items, and they are booking a steadily increasing volume of orders for first quarter shipment. They still are able to take new orders for merchant products for delivery within four to five weeks in some cases.

Demand for spring and manufacturers wire is reported heavy in New England, the bulk of orders being for first quarter delivery. More, but not all, consumers are ordering on longer lead time, 60 to 90 days.

Plates . .

Plate Prices, Page 94

Not all plate producers have opened their books for first quarter orders. In fact, the majority is still trying to get books in better balance before accepting new business for next quarter rolling. Those accepting orders for the period can book far more tonnage than they will be able to produce. Customers are being told what tonnage they can expect to get, and in practically all cases, it runs under requirements.

The largest producer in the Pittsburgh area is opening first quarter books, but it is booking orders cautiously, guarding against overbooking. One small district maker of light plates says its first quarter output already has been promised to fabricators.

Plate fabricators in New England are unable to place firm orders for all the tonnage they seek. Heavier buying by large diameter pipe shops, car builders and shipyards is expected. The stringency in wide and heavy plates is growing, and carryover into first quarter will include a high ratio of tonnage in that category. The seasonal falling off in tank volume is slight.

Lukens Steel Co., Coatesville, Pa., advanced its price on carbon plates $6 a ton to $4.80, mill, effective Oct.

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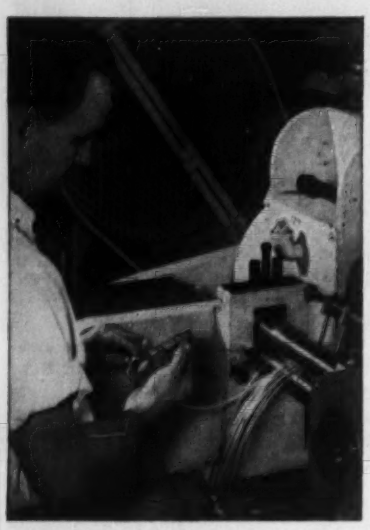

Not one strip rolling requirement in ten need be carefully "miked" to assure close width tolerance.

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Modern rolling, annealing and precision control equipment assure uniform high quality under the most rigid specifications.

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Somers Brass Company, Inc.
WATERBURY, CONN.

20. This action was followed by a similar move by the Claymont Division, Colorado Fuel & Iron Corp. At least one other eastern mill is considering an increase, but there are no indications that the larger producers will increase prices at this time. No changes were made in prices on alloy and clad plates and flanged products.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 95 & 96

No early relief for the tight supply situation in sheets, especially hot-rolled, is in sight. Indications are all the mills will enter the first quarter with unusually heavy carry-overs, so that a substantial portion of the period's production, four to six weeks, will be allotted to care for the overflow.

The extremely tight situation in hot-rolled, which has displaced cold-rolled in the stringency category, appears to have given rise to a rumor that several mills, at least four, are dropping out of the hot-rolled market for the first quarter on that grade. All makers named in the rumor deny such action, however. One says it is maintaining the same product mix as formerly. A second is allocating tonnage on the basis of customers' orders in the first quarter of this year.

Indications are that with supplies tight consumers are finding it increasingly difficult to place their full requirements for the period with their regular mill suppliers and are turning to other mills for relief. These are turning them away with the explanation no extra tonnage is available after carry-over is cared for and needs of regular customers are met.

Most producers have opened their first quarter books and are booking on a full quarterly basis, allowing for substantial carry-overs, particularly in the hot and cold-rolled grades. Some makers are examining their indicated carry-over carefully, going over each grade order-by-order and customer-by-customer, and then rescheduling the business on what, in effect, appears to be a new order basis, starting off with January and continuing on through the remainder of the quarter.

Consumers will not get all the tonnage they seek in first quarter, but the mills are hoping they will be able to deliver what they promised and believe that in most cases customers' operations will not be greatly hampered. The makers anticipate requests for far more tonnage than they can readily accommodate over

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Uniform fine grain size of Somers eyelet brass—less than .010 mm. (75X).

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And this new Selas Furnace provides high production as well as close control of temper and uniformity. It is typical of the modern equipment with which Somers produces copper, brass and other alloys to rigid specifications between .010" and .00075".

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the next five to six months. The fact that hot-rolled now heads the stringency list is seen as providing strong evidence that the tremendous demand for steel being entertained is far broader than stems from the automotive influence alone.

Tubular Goods . . .

Tubular Goods Prices, Page 98

First quarter demand for oil country goods is developing in good volume. Pittsburgh producers report the customary seasonal slowdown in sales has not materialized. Few drilling companies have satisfactory inventories. They need more tonnage, especially alloy specialties. One firm is taking orders for April delivery of alloy tubing, used in the deeper wells. Some mills were forced to cut back on delivery promises for casing in the frst quarter.

In other tubular items, demand for specialties and heat-treated material is greater than productive capacity in the fourth quarter. Tubemakers say they must produce at maximum capacity for the remainder of the year to meet the urgent requirements of their customers.

With the zinc market settling back to a firm 13 cents per lb level following the rescinding of a half-cent increase a week ago by several producers, the threat of an increase in galvanized pipe prices faded. Discounts on pipe automaticaly rise or fall as the price of zinc moves from one established bracket to another.

Semifinished Steel . . .

Semifinished Prices, Page 94

Production has been resumed at Kaiser Steel Corp.'s Fontana Works, Fontana, Calif., following slowdown for two weeks due to a labor dispute.

California's steel production this year may top 3 milion tons, an all-time high. The estimate was made by Max D. Howell, executive vice president, American Iron & Steel Institute. Ten years ago California steel output totaled only about 1,500,000 tons.

Structural Shapes . . .

Structural Shape Prices, Page 94

While competition for structural jobs is keen, fabricated material prices are firmer. Most shops have good order backlogs and are entertaining continued active demand. Some of the larger fabricators in the East have seven to eight months work on hand. Figuring is close on new jobs, however.

Demand is described as diversified, recent contracts including bridges, of-

(Please turn to page 109)

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: Coriot, per gross ton, Palmerton, Pa. 21-23% Mn, $90.50; 19-21% Mn, 1-3% Si, $88; 16-19% Mn, $86.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.50c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 21.85c per lb of contained Mn, packed, carload 22.9c, ton lot 24.5c, less ton 25.7c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max); Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.2c per lb of alloy. Packed, c.l. 12.2c, ton 12.65c, less ton 13.65c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02 max 36.50c, 0.03 max 35c, 0.04 max 34.50c, 0.1 max 36c, 0.15 max 35.75c, 0.2 max 35.50c, 0.5 max 35.25c, 1.0 max 34c, 1.5 max 33.85c, 2.0 max 33.75c. Ton lot, add 2.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. S M x D, bulk 27.4c per lb contained Cr. Packed c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carloads, packed S M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c, delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.2% min, Fe 0.2 max) Contract, cariot, packed 2" x D plate (about ⅛" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.28. Delivered. Spot add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 5% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.75c per lb of contained Si. Packed, c.l. 13.85c, ton lot 15.3c, less ton 16.95c. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg., Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c, per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.1c per lb of briquet, c.l. packed, pallets 12.3c, bags 13.1c; 3000 lb to c.l., pallets, 13.5c; 2000 lb to c.l., bags, 14.3c, less ton 15.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.7c per lb of briquet, c.l. packed, pallets, 12.9c; bags 13.7c, 3000 lb to c.l., pallets, 14.1c; 2000 lb to c.l., bags, 14.9c; less ton 15.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet; packed, pallets, 6.95c; bags, 7.75c; 3000 lb to c.l., pallet, 8.55c; 2000 lb to c.l. bags 9.35c; less ton 10.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packed, pallets 7.1c; bags 7.9c; 3000 lb to c.l. pallets 8.7c; 2000 to c.l. bags 9.5c; less ton 10.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67, delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, deld.; less ton lots $4.70.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed, ½" x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Deld. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal, Fe). Lump, carload, bulk 18.50c. Packed c.l. 17.50c, 2000 lb to c.l. 18.50c, less than 2000 lb 19c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works. Mt. Pleasant, Bigio, Tenn. $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa. $1.24.

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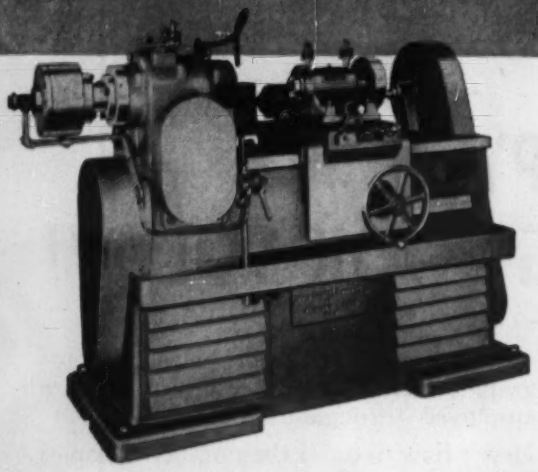

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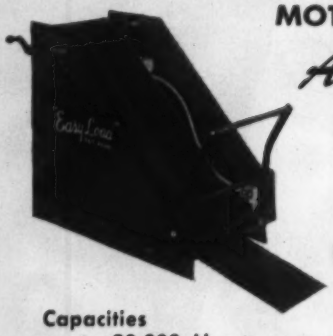

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(*Concluded from Page* 104)

fice buildings, apartments, hospitals and subway construction. Pending inquiry in the area is described as even more diversified.

Pittsburgh district producers expect to sell as much tonnage as they can produce. Order books are being opened for first quarter. There will be substantial carry-over at year end, so that first quarter availability for new business will be limited.

Currently, supplies are scarce, and the mills are making every effort to whittle down indicated year end arrearages. New England fabricators are hard pressed to maintain operating schedules because of lack of adequate supplies of plates and shapes. Wide flange beam shipments are six to eight weeks behind schedule and supplies of light shapes, channels and angles are reported narrowing. Bearing and sheet piling shipments also are falling behind schedule.

Bath Iron Works, Bath, Me., is expanding its structural and plate assembly facilities, expenditures being in excess of $2 million.

Inland Steel Co. demonstrated a new semiautomatic mill for rolling wide flange beams at its Indiana Harbor Works on Oct. 26. Current production is limited to trial runs of beams in 8, 10 and 12-in. sections. The mill is designed to produce sizes ranging from 8 to 24 in.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4700 tons, DeKalb Ave. subway station bypass, Brooklyn, N. Y., through Poirier & McLane, general contractor, to Harris Structural Steel Co., New York.

3700 tons, plant, Carlisle Finishing Co., Carlisle, S. C., to Belmont Iron Works, Eddystone, Pa. (Previously noted as project in the South).

2000 tons, apartment, 66th St. and Third Ave., New York, to Bethlehem Steel Co., Bethlehem, Pa.

1650 tons, state bridge work, Philadelphia, through Buckley & Co., Philadelphia, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

1410 tons, apartment house development, Levitt House Inc., 162nd St., Beechhurst, Long Island, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; project may eventually require 5250 tons.

985 tons, alterations and additions to Associated Hospital building, 80 Lexington Ave., New York, through Rheinstein Construction Co., to Schacht Steel Construction Inc., New York.

850 tons, three buildings, Electro-Metallurgical Division, Union Carbide & Carbon Corp., Sault St. Marie, Mich., to Lackawanna Steel Construction Corp., Buffalo.

600 tons, boiler supports, boiler house, Omaha, Nebr., for Combustion Engineering Co., to Gate City Steel Co., Omaha, Nebr.

675 tons, World Trade building, United Nations Plaza, New York, through Harrison & Abramovitz, contractors, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

315 tons, office and library, Continental Baking Co., Rye, N. Y., to Grand Iron Works, Bronx, New York, through Strobel & Saltzman.

600 tons, bridge replacement, Noxon Rapids, Mont., railroad relocation, Washington Power Co., Spokane, Wash., power plant project, to Kansas City Structural Steel Co., Kansas City, Kans.; Peter Kiewit Sons Co.,

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$34.50-$35.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 95c-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	32.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.60-$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: St. Louis, $150.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawston, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawston, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $194; Danville, Ill., $197; Philadelphia, $201.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $241; Danville, Ill., $244; Philadelphia, $248.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., Philadelphia, $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $286.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned bulk, Millmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅝-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.25-$14.00
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$25.50
Camden, N. J., ovens	25.00
Everett, Mass., ovens	
New England, deld.	*27.05
Chicago, ovens	25.75
Chicago, deld.	27.25
Terre Haute, Ind., ovens	25.50
Milwaukee, ovens	26.25
Indianapolis, ovens	25.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
Painesville, O., ovens	26.25
Cleveland, deld.	28.18
Birmingham, ovens	24.40
Cincinnati, deld.	29.33
Buffalo, ovens	25.75
Buffalo, deld.	27.00
Lone Star, Tex., ovens	19.50
Neville Island, Pa., ovens	25.00
Philadelphia, ovens	25.00
Swedeland, Pa., ovens	25.00
St. Paul, ovens	25.00
Detroit, ovens	26.25
Detroit, deld.	27.25
Pontiac, deld.	27.81
Saginaw, deld.	29.33

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 14.00; Grade 2-3, 13.50; Grade 4, 13.50; Grade 5, 14.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5¼	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25
CARBON		
8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

Longview, Wash., general contractor.

300 tons, building, National Lead Co., Syracuse, N. J., through United Engineers & Constructors, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

275 tons, galvanized towers, Louisiana Power & Light Co., Westwego, La., to Hepinstall Steel Co.

235 tons, Veeder Root plant, Altoona, Pa., through Ford, Bacon & Davis, New York, engineers, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

225 tons, warehouse addition, Edgecomb Steel Co., York, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

210 tons, pipe foundry, Warren Pipe & Foundry Co., Phillipsburg, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

105 tons, Idaho state Priest river bridge project, to Bethlehem Pacific Coast Steel Corp., Seattle; Peter Kiewit Sons Co. and LeBouef Daugherty Co., Sandpoint, Idaho, general contractors, low at $323,783.

100 tons, including steel piling, state bridge, Little Black river, Allagash Plantation, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Norman E. Jackson Inc., Pittsfield, Me., general contractor.

STRUCTURAL STEEL PENDING

2500 tons, state bridge, Johnstown, Pa.; bids Nov. 18.

1350 tons, municipal incinerator, Greenpoint, Brooklyn, N. Y.; Five Boroughs Contracting Co., low on general contract.

1300 tons, transmission towers, Pennsylvania Light & Power Co., Allentown, Pa.

950 tons, Washington state arch bridge, Skagit county; Newkirk Bros., Seattle, low at $632,781.

300 tons, Montana state 971-ft Custer county Yellowstone river bridge; bids to Helena, Mont., Oct. 27.

250 tons, Montana state 576-ft Big Horn county bridge; bids to Helena, Mont., Oct. 27.

200 tons, Ladd Air Field, Alaska, bulk warehouse; bids to U. S. Engineer.

100 tons, 170-ton traveling crane for Mayfield powerhouse; bids to Tacoma, Wash., Nov. 21.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, addition, Simplex Wire & Cable Co., Newington, N. H., to Concrete Steel Co., Boston; Vappi Construction Co., Boston, general contractor.

100 tons, Seattle apartment building, and state highway projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

535 tons, Washington state, Capitol Lake bridge, Thurston county; MacRae Bros., Seattle, low at $425,469.

140 tons, also 13,686 feet of piling, Idaho state 373-ft bridge, Gooding county; general contract to Neilsen & Smith, Twin Falls, Idaho, low at $220,700.

100 tons, guided missile project, Redmond, Wash.; Kuney-Johnson Co., Seattle, low at $516,785 to U. S. Engineer, Seattle.

PLATES . . .

PLATES PLACED

500 tons, municipal water storage, Hood River, Oreg., to American Pipe & Construction Co., Portland, Oreg.

465 tons, five tanks, Esso Standard Oil Co., Ogdensburg, N. Y., to unnamed fabricator.

175 tons, 80,000-bbl tank, Esso Standard Oil Co., Newport News, Va., to Hammond Iron Works, Warren, Pa.

100 tons, tanks, Esso Standard Oil Co., Charleston, W. Va., to unnamed fabricator.

PLATES PENDING

500 tons plus, four 25,000-bbl and one 15,000-bbl bulk fuel storage tanks, Galena Air Base, Alaska; bids to U. S. Engineer, Seattle, Nov. 18.

500 tons plus, eight 25,000-bbl underground tanks, Elmendorf Air Base, Alaska, fuel system; bids to U. S. Engineer, Nov. 15.

200 tons, two tanks 25,000-bbl capacity, Fairchild Air Base, Washington state; bids to U. S. Engineer, Seattle, Nov. 17.

180 tons, also reinforcing and shapes, 1100 feet of 72-in. steel outlet pipe, stilling basin, Missouri river basin, Titus dam; bids to Bureau of Reclamation, Denver, Oct. 31.

PIPE . . .

STEEL PIPE PLACED

900 tons, comprising 600 feet of 20-in. and 14,000 feet of 30-in. steel pipe, Esso Standard Oil Co., Bayway, N. J., to unnamed fabricator.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Central Railroad of New Jersey, six 2400-hp diesel-electric locomotives, to Fairbanks, Morse & Co., Chicago.

RAILROAD CARS PLACED

Canadian National, one rail diesel car to the Budd Co., Philadelphia.

Chicago & Eastern Illinois, one rail diesel car to Budd Co., Philadelphia, and 25 steel cabooses to International Railway Car Co., Kenton, O.

Chicago, Rock Island & Pacific, 225 seventy-ton covered hopper cars to Pullman-Standard Car Mfg. Co., Chicago.

Delaware & Hudson, 500 fifty-ton boxcars to Pullman-Standard Car Mfg. Co., Chicago.

Delaware, Lackawanna & Western, 1000 freight cars costing $8 million; 900 fifty-ton boxcars to Magor Car Corp., Clifton, N. J.; 400 fifty-ton boxcars to ACF Industries Inc., Berwick, Pa., also 100 seventy-ton hopper cars.

Norfolk-Southern, will lease through Hyman-Michaels Co. 100 fifty-ton gondolas to be built by Magor Car Corp., New York.

Norfolk & Western, 1000 hopper cars, with 500 going to the Bethlehem Steel Co., Bethlehem, Pa., and 500 to the Greenville Steel Car Co., Greenville, Pa.

Wisconsin Central, 45 boxcars, to own shops at North Fond du Lac, Wis.; 15 covered hopper cars pending.

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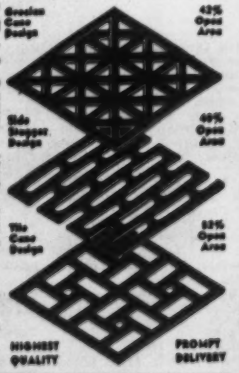

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Scrap . . .

Scrap Prices, Page 112

New York—Steel scrap prices appear to have reached a level where supplies are moving adequately. Despite high steel operating rates, the mills are obtaining enough scrap to meet requirements and still maintain reasonably good stocks. Most sellers and consumers do not look for any important increases or decreases in prices in the near future.

The adequate flow of material to the domestic mills is being sustained despite the movement of some 400,000 tons or so per month abroad. Italy and West Germany are the chief buyers, with fairly sizable tonnages going to Great Britain and Japan. Foreign buyers would like to have more, but they would have to pay more for tonnage.

Brokers' buying prices are unchanged throughout the list, following a few scattered and rather minor changes a week ago.

Pittsburgh — The upward trend in railroad scrap and blast furnace grades has leveled off, at least temporarily. Scrap is moving well, and demand is considered firm. Trade sources expect no change in No. 1 heavy melting quotations for the immediate future. Steelmakers are planning production schedules for first quarter.

Buffalo—Steady strength prevails in the local scrap market, and dealers are anticipating no price changes on new business expected to be placed by leading mill consumers within a week. Market opinion indicates that current price ranges are in line with present conditions in the steel industry.

Philadelphia — Strength prevails throughout the list of scrap prices with rail crops, 2 ft and under, higher at $59-$60, delivered, and No. 1 cupola cast at $42-$43.

Open-hearth grades are moving steadily, not only for domestic account but foreign requirements as well. One cargo of scrap is being loaded for export here, and at least one, possibly two, additional cargoes will be loading here shortly.

In general, export prices have not shown much change recently, although some premiums of as much as $1 a ton have been paid for limited quantities needed urgently in rounding out a shipment.

Cleveland—Scrap prices are unchanged here and in the Valley. Little new buying is noted, and for the most part the market is drifting pending new developments. Within the next week or so a definite trend is expected to become apparent when the large automotive lists come out. Currently, steel mill stocks are described as only fair. The same is reported with respect to dealers' yard stocks. With winter approaching and high level steelmaking operations indicated well into next year, scrap brokers and dealers anticipate a substantial pickup in buying by consumers before cold weather seriously curtails collections and preparation.

Steel mill executives at Youngstown express increasing concern about the scrap situation. Area mills are using a high percentage of hot metal charges because of the low demand for bessemer steel, thus helping to keep the price of scrap under control.

Chicago—Small volume of buying and price softness combine to make an unsettled scrap market here. A few downward adjustments of $1 to $2 a ton a week ago remain fairly well contained and tend to dry up new buying. Mills are dipping into inventories as they limit their buying at a time when the steelmaking rate has climbed to the highest since the first week in June. Broker-dealer trading appears to continue on the basis of an easier market.

Washington — Stocks of ferrous scrap held by consumers on Aug. 31 totaled 6,571,000 gross tons, the largest quantity on hand since Dec. 31, 1954, and an increase of 3 per cent over those on July 31, reports the Bureau of Mines.

The 2,215,000 tons of pig iron held by consumers and suppliers were 6 per cent greater than at the end of July, stocks being up for the third consecutive month.

Consumption of ferrous materials in August totaled 11,666,000 gross tons, an increase of 7 per cent over July. Scrap use totaled 5,900,000 gross tons, up 8 per cent from July. Pig iron accounted for 5,766,000 tons, up 6 per cent.

Cincinnati — Prices remain unchanged here. A little softness is apparent, but it is doubted a trend is indicated.

Detroit—Dealers continue to mark time in the scrap market. The future trend is expected to be indicated when automotive lists are closed soon. Currently, the only price change of record is on short shovel turnings, now quoted at $24.50. The district ingot rate last week rose to 101 per cent from 98 the week preceding. A year ago it was 80.

Birmingham — Little activity is noted in open-hearth scrap, with dealers busy filling old orders. Electric furnace grades, however, show considerable activity. Consumers of the cast grades are playing use of pig iron against scrap in an effort to keep scrap prices down.

Los Angeles—Long anticipated price increases materialized last week. No. 1 heavy melting and No. 1 bundles moved $2 forward to $39; No. 2 heavy melting advanced $7 to $37; and No. 2 bundles jumped $6 to $33. Machine shop turnings are listed at $12, an increase of $2.

San Francisco—Steel scrap prices have been raised for the second time in two weeks, advancing $1 to $4 a ton.

Seattle—Scrap prices are firm and receipts are large. Consumption is heavy. Inventories are below normal and export interests are buying in volume.

Conditions change from day to day and published prices are subject to frequent adjustment. Well informed sources state current prices are $44 for No. 1 heavy melting, $40 for No. 2, $34 for No. 2 bundles, $40 for No. 1 cast and $35 for heavy breakable.

Iron Ore . . .

Iron Ore Prices, Page 100

Shipments of Lake Superior iron ore totaled 2,719,638 gross tons in the week ended Oct. 24, reports the Lake Superior Iron Ore Association. This was about 1 million tons more than was moved in the like week of the 1954 season and was only about 200,000 tons under the movement in the corresponding week of record 1953.

Cumulative shipments for the 1955 season on Oct. 24 were 76,891,121 tons. This was more than 20 million tons above the total moved to Oct. 24 in the 1954 season and was only 11,821,192 tons behind record 1953 shipments.

Pig Iron . . .

Pig Iron Prices, Page 99

Blast furnace production of pig iron, ferromanganese and spiegeleisen increased in September, reports the American Iron & Steel Institute. Output for the month totaled 6,703,366 net tons, of which 6,653,578 tons were pig iron and 49,788 ferromanganese and spiegeleisen.

August output was 6,601,482 tons, pig iron accounting for 6,529,580 and ferromanganese and spiegeleisen, 71,902 tons. In September, 1954, output totaled 4,461,822 tons, 4,417,888 tons being pig iron and 43,934 ferromanganese and spiegeleisen.

Output totaled 57,178,647 tons in the first nine months of this year. This was divided: 56,680,072 tons, pig iron, and 498,575 tons, ferromanganese and spiegeleisen. In the like period last year, output amounted to 42,857,333 tons, of which 42,447,089 tons were pig iron and 410,244 tons,

(Please turn to page 114)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Oct. 26	$45.00
Oct. 19	45.00
Sept. Avg.	44.42
Oct. 1954	32.25
Oct. 1950	41.37

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	44.00-45.00
No. 2 bundles	37.00-38.00
No. 1 busheling	44.00-45.00
Machine shop turnings	30.00-31.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	33.00-34.00
Cast iron borings	33.00-34.00
Cut structurals, 3 ft lengths	49.00-50.00
Heavy turnings	42.00-43.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	39.00-40.00
Heavy breakable cast	39.00-40.00
Unstripped motor blocks	29.00-30.00
No. 1 machinery cast	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	52.00-53.00
Railroad specialties	54.00-55.00

Stainless Steel Scrap

18-8 bundles & solids	270.00-285.00
18-8 turnings	130.00-140.00
430 bundles & solids	100.00-110.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	45.00-46.00
No. 2 bundles	35.00-36.00
No. 1 busheling	45.00-46.00
Machine shop turnings	23.00-24.00
Mixed borings, turnings	27.50-28.50
Short shovel turnings	27.50-28.50
Cast iron borings	27.50-28.50
Low phos.	45.00-46.00
Cut structural plates 2 ft and under	49.00-50.00
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	40.00-41.00
Stove plate	46.00-47.00
Heavy breakable cast	37.00-38.00
Unstripped motor blocks	29.00-30.00
Brake shoes	35.00-36.00
Clean auto cast	48.00-49.00
Burnt cast	37.00-38.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	53.00-54.00
Rails, 2 ft and under	62.00-63.00
Rails, 18 in. and under	63.00-64.00
Rails, random lengths	58.00-59.00
Cast steel	48.00-49.00
Railroad specialties	54.00-55.00
Uncut tires	49.00-50.00
Angles, splice bars	54.50-55.50
Rails, rerolling	63.00-64.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	290.00-300.00
18-8 turnings	130.00-140.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	47.50-48.50
No. 2 heavy melting	35.00-36.00
No. 1 bundles	47.50-48.50
No. 2 bundles	32.00-33.00
No. 1 busheling	47.50-48.50
Machine shop turnings	24.00-25.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	47.50-48.50
Electric furnace bundles	47.50-48.50

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00

CHICAGO

No. 1 heavy melting	43.00-45.00
No. 2 heavy melting	34.00-35.00
No. 1 factory bundles	46.00-47.00
No. 1 dealer bundles	43.00-44.00
No. 2 bundles	33.00-34.00
No. 1 busheling	*43.00-45.00*
Machine shop turnings	27.00-28.00
Mixed borings, turnings	29.00-30.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals, 3 ft	49.00-50.00
Punchings & plate scrap	50.00-51.00

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	37.00-38.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	*51.00-52.00*
Drop broken machinery	*51.00-52.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*47.00-48.00*
R.R. malleable	56.00-57.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Angles, splice bars	57.00-58.00
Rails, rerolling	65.00-66.00

Stainless Steel Scrap

18-8 bundles & solids	290.00-300.00
18-8 turnings	160.00-170.00
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	40.00
No. 2 heavy melting	30.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	22.50
Mixed borings, turnings	22.50
Short shovel turnings	*24.50*
Punchings & plate scrap	46.50

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Stove plate	32.00
Heavy breakable	32.00
Unstripped motor blocks	22.00
Clean auto cast	44.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	38.00-39.00
No. 2 bundles	28.00-29.00
No. 1 busheling	38.00-39.00
Cast iron borings	17.00-18.00
Short shovel turnings	*27.00-28.00*
Machine shop turnings	*26.00-27.00*
Electric furnace bundles	42.00-43.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate	*46.00-47.00*
Structural plate, 2 ft	*45.00-46.00*
Unstripped motor blocks	36.00-37.00
Charging box cast	30.00-31.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00
Rails, 18-in. and under	58.00-59.00
Rails, rerolling	57.00-58.00
Rails, random lengths	52.00-53.00
Angles, splice bars	*54.00-55.00*

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	46.00-47.00
No. 2 bundles	37.00-38.00
No. 1 busheling	46.00-47.00
Electric furnace bundles	48.50
Machine shop turnings	28.50-29.50
Mixed borings, turnings	28.50-29.50
Short shovel turnings	30.50-31.50
Structurals & plate	49.00-50.00
Heavy turnings	43.00
Couplers, springs, wheels	51.00-52.00
Rail crops, 2 ft & under	*59.00-60.00*

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Malleable	59.00
Heavy breakable cast	45.00-46.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	37.00-38.00
No. 1 bundles	41.00-42.00
No. 2 bundles	32.00-33.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	22.00-23.00
Low phos. (structural & plate)	42.00-43.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	38.00-39.00

Stainless Steel

18-8 sheets, clips, solids	290.00-300.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	31.00-31.50
No. 1 bundles	*38.00-39.00*
No. 2 bundles	27.00-27.50
Machine shop turnings	20.00-20.50
Mixed borings, turnings	22.50-23.00
Short shovel turnings	23.50-24.00
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	35.00-36.00
No. 1 bundles	38.00-39.00
No. 2 bundles	32.00-33.00
No. 1 busheling	38.00-39.00
Mixed borings, turnings	28.00-29.00
Machine shop turnings	26.00-27.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	45.00-46.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	47.00-48.00
Rails, 2 ft and under	51.00-52.00
Railroad specialties	48.00-49.00

CINCINNATI

Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	41.50-42.50
No. 2 heavy melting	36.00-37.00
No. 1 bundles	41.50-42.50
No. 2 bundles	33.00-34.00
No. 1 busheling	41.50-42.50
Machine shop turnings	27.00-28.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	30.00-31.00
Cast iron borings	24.00-25.00
Low phos., 18 in.	50.00-51.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	41.00-42.00
Charging box cast	41.00-42.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	60.00-61.00
Rails, random lengths	53.00-54.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.50
No. 2 heavy melting	36.00
No. 1 bundles	39.50
No. 2 bundles	31.50
Machine shop turnings	28.00
Short shovel turnings	28.00

Cast Iron Grades

No. 1 cupola	46.50
Charging box cast	39.00
Heavy breakable cast	37.00
Unstripped motor blocks	37.00
Brake shoes	36.00
Clean auto cast	47.00
Stove plate	*38.00*

Railroad Scrap

No. 1 R.R. heavy melt.	48.00
Rails, 18 in. and under	59.00
Rails, random lengths	*56.00*
Rails, rerolling	64.00
Angles, splice bars	55.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	*44.00*
No. 2 heavy melting	*40.00*
No. 1 bundles	*39.50*
No. 2 bundles	*34.00*
No. 3 bundles	19.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	50.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	43.00
Heavy breakable cast	38.00
No. 1 wheels	35.00
Unstripped motor blocks	29.00
Clean motor blocks	40.00
Stove plate (f.o.b. plant)	30.00
Brake shoes	35.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths	33.00

LOS ANGELES

No. 1 heavy melting	*39.00*
No. 2 heavy melting	*37.00*
No. 1 bundles	*39.00*
No. 2 bundles	*35.00*
Machine shop turnings	*12.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	43.00-45.00

SAN FRANCISCO

No. 1 heavy melting	*39.00*
No. 2 heavy melting	*37.00*
No. 1 bundles	*39.00*
No. 2 bundles	*33.00*
No. 1 busheling	*39.00*
Machine shop turnings	*18.00*
Mixed borings, turnings	*18.00*
Short shovel turnings	*20.00*
Cast iron borings	*18.00*
Cut structurals	*41.00*
Heavy turnings	*20.00*
Punchings & plate scrap	*39.00*

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	35.00
Stove plate	39.00
Heavy breakable cast	36.00
Unstripped motor blocks	32.00
Brake shoes	35.00
Clean auto cast	45.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	38.50
No. 2 heavy melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Mixed borings, turnings	17.00
Rails, remelting	47.50
Busheling, new factory: Prepared	36.50
Unprepared	32.50
Short steel turnings	21.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

Joseph Hall

A water-powered trip hammer forging a bloom started in the puddling furnace shown in the background. *This is the tenth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.*

1830
Pig Boiling

Of the early developments in iron and steel production the puddling process has stood the test of time.

First conceived by Henry Cort as the "dry puddling" process and later modified by Joseph Hall's "pig boiling" process, it has remained essentially the same for a century and a half.

Hall's improvement was to eliminate the waste of iron, which at times ran as high as 30 per cent of the charge. He did this by substituting air cooled cast iron bottoms for the sand hearth lining and shortened the time of heat.

The key operational point in wrought iron manufacture is the pouring of molten refined iron into a bath of liquid slag to form a sponge-like ball of iron impregnated with liquid slag. This refined iron is defined as iron bars rolled from a box pile of muck bars and wrought iron scrap bars free from steel.

The extreme selectivity of a charge points up the importance of scrap of known analysis, a problem particularly suited to our experience, personnel, equipment and the strategic location of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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Philadelphia 7, Penna.

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READING, PENNA.
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ERIE, PENNA.

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EXPORTS-IMPORTS **LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

(*Concluded from page* 111)

ferromanganese and spiegeleisen.

Pig iron shipments this month are the best since last May. Late ordering for tonnage to be delivered before month end is expected to push bookings in October to the top for the year. Most foundries are operating at 80 to 100 per cent of capacity. Some are operating six days a week.

Supply of merchant iron is still adequate to accommodate demand. Some sellers believe the situation will be tighter before the end of November, when a year end easing is regarded as likely to set in. The complaint of sellers is that users do not order far enough ahead, making difficult the planning of shipping schedules.

Strength of the market is reflected by the recent $6 a ton increase in prices on basic, foundry and malleable iron at Chester, Pa. The move brought prices of this producer to the level of other district furnaces. There is no indication of a pending increase by other producers.

Little or no foreign iron is coming in. This is a favorable situation for domestic producers.

Republic Steel Corp. lighted its No. 2 furnace at Cleveland on Oct. 18. This stack had been out of production for two years. All six of the firm's furnaces at Cleveland are in production for the first time since the fall of 1953.

Rails, Cars . . .

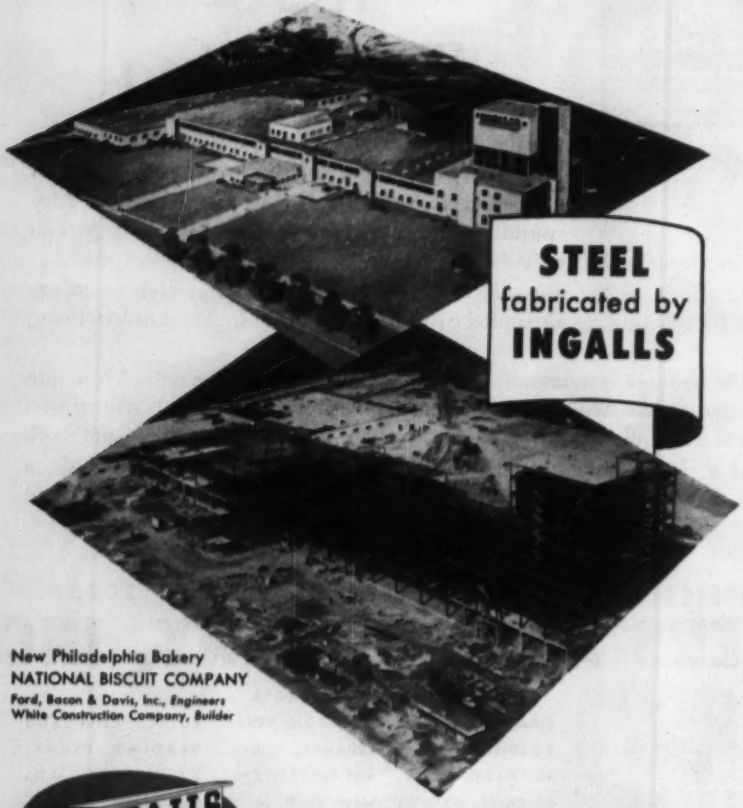
Track Material Prices, Page 97

Domestic freight car orders dropped sharply in September to 3228 units, compared with 13,405 in the preceding month, according to the American Railway Car Institute and the Association of American Railroads.

September orders, however, exceeded those of a year ago when 2396 cars were placed. During the three months prior to September this

It Comes in a Package...

Just as famous NBC cookies and crackers come in packages, 6300 or more tons of steel were welded together to "package" the largest National Biscuit Company bakery to be built in the United States. With steel supplied by Ingalls, this giant food manufacturing plant represents one of many of Ingalls' steel fabricating services.



New Philadelphia Bakery
NATIONAL BISCUIT COMPANY
Ford, Bacon & Davis, Inc., Engineers
White Construction Company, Builder

THE INGALLS IRON WORKS COMPANY
BIRMINGHAM, ALABAMA

Sales Offices: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans
Plants: Birmingham, Ala.; Verona, Pa.; Pascagoula, Miss.; North Birmingham, Ala.; Decatur, Ala.

MAINTENANCE ENGINEER OR GENERAL MASTER MECHANIC—Age 38 to 45 with 15 years experience in heavy Steel Plant maintenance-technical education or practical equivalent. Supervisory ability, knowledge of maintenance trades necessary. Permanent position with Eastern Penna. Steel Company. Send resume, salary expected to Box 324, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED

Help Wanted

PLANT SUPERINTENDENT
HEAVY STEEL FABRICATION PRESSURE VESSELS—HEAT EXCHANGERS

Experienced person of mature judgment required to supervise all aspects of shop fabrication consisting of heavy steel, stainless, nickel, etc., miscellaneous welded fabricated products. Knowledge of ASME, API, and similar codes as well as general machining operations required. Long actual working experience on welding, fitting, layout and press work as well as similar supervisory background essential. Must have thorough knowledge of materials and man hours. This is a well-paying career opportunity in pleasant medium size engineering and manufacturing company located in Metropolitan New York area. All replies will be held in strict confidence. Send full resume to Box 327, STEEL, Penton Building, Cleveland 13, Ohio.

TITANIUM METALLURGIST. Either experienced man or one interested in entering this field covering titanium production in mill converting to bars, forgings, sheet, strip and wire. Work will include both the technical and production aspects of material. Send information giving education, experience, age references, etc. Reply Box 330, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

BLAST FURNACE SUPERINTENDENT. Basic, merchant iron. Single, multi-furnace plants. Cost conscious, organizational ability. Excellent operating, labor relations, and engineering background. Tech. graduate, 43 years old. Reply Box 320, STEEL, Penton Building, Cleveland 13, Ohio.

AVAILABLE
PLANT SUPERINTENDENT
STRUCTURAL STEEL FABRICATION

Have had over 30 years experience, supervising the fabrication of bridge girders, plate girders, trusses, columns, floor beams, girts, etc., required for industrial and apartment construction, either welded, riveted or bolted. Can assume full responsibility from point of mill order, details, tempiate (wood or paper) fitting punching, layout and assembly departments. All supervision from floor of plant with the men. Have excellent experience with trade and labor. Supervised plant with average tonnage of 12,600 tons per year. Willing to move anywhere. Reply Box 326, STEEL, Penton Bldg., Cleveland 13, Ohio.

CHIEF MANUFACTURING ENGINEER—MASTER MECHANIC—TOOLING SUPERINTENDENT. Seeking new field. Graduate Engineer. Age 47. Specialized stampings, deep draw, progressive. Automation. Reply Box 332, STEEL, Penton Building, Cleveland 13, Ohio.

INDUSTRIAL ENGINEERS

Prefer Steel Mill Experience

Career opportunities are available for supervisory and non-supervisory industrial engineers with training or experience in methods engineering or incentive plans. If your present position does not fully utilize your capacity, we may have the opening you are looking for, with a future potential limited only by your demonstrated performance.

Must be willing to locate in Southern California at the Fontana plant of Kaiser Steel Corporation.

Send complete resume, including education, experience, and salary requirements to Employment Manager

KAISER STEEL CORP.
P.O. BOX 217
Fontana, California

MECHANICAL ENGINEER

Manufacturer of fabricated metal components, located southeastern Michigan, needs engineer with at least five years experience in research and general mechanical engineering, or with equivalent practical experience. College graduate preferred. Practical ingenuity required for maximum efficiency in design and production processing; also capacity to take charge as chief engineer when directed by management. All replies held in confidence. Send resume of qualifications, with small photograph, stating approximate salary desired to:

Box 328, STEEL
Penton Building — Cleveland 13, Ohio

EASTERN FABRICATOR OF PLATE AND STRUCTURAL STEEL IN PENNSYLVANIA-JERSEY AREA WANTS

CHIEF ENGINEER
DESIGNER - DRAFTSMAN
PURCHASING AGENT

Old established Company in phase of modernizing equipment and personnel. Excellent opportunity for experienced men in above classifications. State experience, past connections, education and positions held.

Replies Confidential

Box 329, STEEL
Penton Building — Cleveland 13, Ohio

METALLURGICAL GRADUATES

Openings in mill production metallurgical group and laboratory in mill producing high speed steels, tool steels, stainless, high temperature alloys and many specialty steels. Will consider both experienced men and recent graduates interested in these fields. Reply giving details of education, experience, age references, etc.

Address Replies to:
Personnel Department
UNIVERSAL-CYCLOPS STEEL CORPORATION
Bridgeville, Pennsylvania

FOR CLASSIFIED RATES

And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

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Permanent Opportunities with

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Cleveland, Ohio Offices

McKEE with more than 50 years of successful operation, doing business all over the world; is one of the largest, oldest and best known engineering and contracting firms in the business. The McKEE organization continues to grow and expand, thereby offers many present and future opportunities for qualified and experienced engineers and designers in the following fields:

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Here is a rare opportunity for you to utilize your engineering abilities and talents.

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PLEASE SEND RESUME TO:

Edward A. Koiner

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Cleveland 1, Ohio

INDUSTRIAL ENGINEERS

Large Midwestern steel producer has several openings for young engineers who know steel operations, with at least two years experience in Time Study and Methods Analysis.

Submit resume to:

Personnel Director.

Great Lakes Steel Corp.
Ecorse, Detroit 29, Mich.

WANTED

STEEL DROPS IN CIRCLES OR SQUARES—Can use truck load or carload quantity of Hot Roll Pickled, Cold Roll, or Drawing Quality Steel in 25⅛" to 27" squares or 25⅛" to 30" circles in 15 or 16 Ga. Steel. If interested, write to Box 331, STEEL, Penton Bldg., Cleveland 13, Ohio, giving quantity, size of drops, gauge and price.

LARGE MACHINE AND WELDMENT CAPACITY

Open capacity on 24 ft. and 10 ft. Vertical Boring Mills 7", 5" and 4" Horizontal Boring Mills; large radials and supporting small machines including new 2 AC Warner & Swasey automatic chucking. Especially interested in producing weldments requiring machining.

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Sedgley Ave. at 19th & Lehigh
Philadelphia 32, Pa.
Phone: Henry Kingston—Sagamore 2-6500

FOR SALE--

R.R. EQUIPMENT

Immediate Delivery

- **REPAIRED**
- **REBUILT**
- **or "AS IS"**

Hopper Cars - Tank Cars
Flat Cars - Gondola Cars
50 and 70 ton Capacities
Tank Car Storage Tanks
Locomotives and Locomotive Cranes

All work on cars executed in our modern and well-equipped plant at Landisville (Lancaster County), Pennsylvania.

RAIL & INDUSTRIAL EQUIPMENT CO., Inc.

30 Church Street, NEW YORK 7, N. Y. — RR Yard & Shops, LANDISVILLE, PA

ROLLING MILL WANTED

Four-stand 10" to 16" Wide

2-High Tandem Cold Mill

Reply Box 333, STEEL

Penton Building — Cleveland 13, Ohio

FOR SALE

11—75-ton capacity double hook blocks with 24" Roller Bearing sheaves with 3150# weight block (detachable). Mfg. Sauerman Bros. Model C-7210.

100—30 long ton and 40—10 long ton safe working load Tinker Roller Bearing Hooks.

Other Sizes Also Available

WEbster 8-2701

WESTERN MACHINERY COMPANY
8161 W. 3rd Street
Los Angeles 48, California

year, 44,777 cars were awarded. This total, with September buying, brought order backlogs as of Oct. 1 to 52,913 units, against 11,993 on Oct. 1, 1954.

Of September orders, 2518 cars were placed with commercial car shops, 710 with railroad shops.

Deliveries of new cars in September were 3118 units, against 3480 in units, against 11,993 on Oct. 1, 1954.

Warehouse . . .

Warehouse Prices, Page 99

In terms of demand, distributors rate October as the best month so far this year. Volume of inquiry increased throughout the month, not only from regular customers but from buyers who normally look to the mills to fill their needs. However, some leading distributors doubt that bookings in October will surpass September's or will be as heavy as those in certain of the spring months. Unbalanced inventories have prevented warehouses from booking all business offered.

Items in most critical supply are shapes and plates; stringency exists in practically all other major products.

Some mills plan to take orders for plate and sheet for only two of the months in the first quarter. As order books are just being opened for the first quarter, warehousemen don't know when they will be able to replenish and round out their inventories.

Distributors find no hectic buying on the part of small fabricators. They have received rush orders for plate from former mill customers, but their regular customers for tube, bars and other products have been able to fill their needs in an orderly fashion.

Steel Bars . . .

Bar Prices, Page 94

The first quarter situation in commercial steel bars is gradually clarifying. There are, however, some large sellers who are not able to assure customers what tonnage they will receive in the early part of the quarter. Contrary to usual procedure in some other products, it appears a number of bar sellers are opening books on a month-to-month basis in arranging their first quarter rolling schedules.

Pressure for all sizes and specifications of hot carbon bars continues strong. No sooner does it appear that the emphasis is on the small sizes than there is a wave of demand for the medium and larger sizes.

In New England, consumers report they can place orders for cold-finished and alloy grades for January delivery, even late December. But hot-rolled bars provide another story, indications being that the carry-over from the current quarter may run as much as two months of production in some instances.

Orders from machine tool builders are reported increasing at Pittsburgh, adding to the tightness in supply. Doubt as to delivery dates is resulting in some duplication of orders, it is believed.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 109

Foundry coke orders are improving but not as rapidly as is demand for pig iron, according to Chicago area sellers. Consumers prefer to manage on minimum inventory since replacement is easy. Good business is indicated for the remainder of the year.

While foundry coke appears adequate to meet consumers' needs, a supply pinch is being felt in furnace coke. Some blast furnace operators are buying in the open market to supplement supplies made short by the taking off of some of their own ovens for repairs or replacement with new facilities. Coke is reported moving into the Midwest from as far away as New England.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 94

The seasonal factor in demand for reinforcing steel products is blunted this year. So many large projects are under way or in process that consumers want earliest possible shipments.

Among long-term construction programs exerting important influence on the market are the Calumet-Sag waterway, toll road and highway programs in Illinois, Indiana and Connecticut and the St. Lawrence seaway.

On the Pacific Coast, reinforcing bar producers are operating close to capacity. Order backlogs are described as normal. Deliveries run 45 to 60 days.

Tin Plate . . .

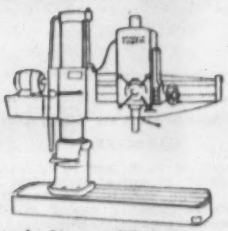
Tin Plate Prices, Page 96

Output of metal and fiber containers for California food and beverage products will exceed 8 billion 700 million units in 1956, it is estimated by Alexander Black, sales chief of American Can Co. He said an additional 275 million containers will be required for a record pack of nonfood products.

LET SIMMONS REBUILD AND MODERNIZE YOUR RADIAL DRILLS

Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1755 North Broadway, Albany 1, N. Y.



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Unconditional guarantee...our standard since 1910

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The Red Circle on the Roll is the Hyde Park mark of Quality. Hyde Park makes rolls for every type mill.

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Nickel Chilled Rolls
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Cold Rolls
Sand Rolls

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Finer Finish, Longer Life
and Greater Tonnage
specify Red Circle

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS • ROLLING MILL MACHINERY
GREY IRON CASTINGS

Smooth sailing for Junior on springs of Steel

It's plain to see that Junior is tickled pink with his brand new stroller. Sleek and smartly styled, it glides along smoothly on bump-absorbing steel springs.

These baby-stroller springs are made from narrow strips of carbon spring steel which are heated to the required temperature, formed into shape, then air-cooled. The result: mighty smooth sailing for the small fry.

Leading manufacturers of baby strollers and carriages use substantial tonnages of Bethlehem carbon spring steel, as well as other Bethlehem hot-rolled carbon-steel bar products, for axles, foot pedals, brakes, shackles and miscellaneous parts.

The combined requirements of many active and growing industries have created an unprecedented peacetime demand for hot-rolled carbon-steel bars. We're doing our best to meet this demand, all the while maintaining the quality standards that our customers expect of products bearing the Bethlehem name.

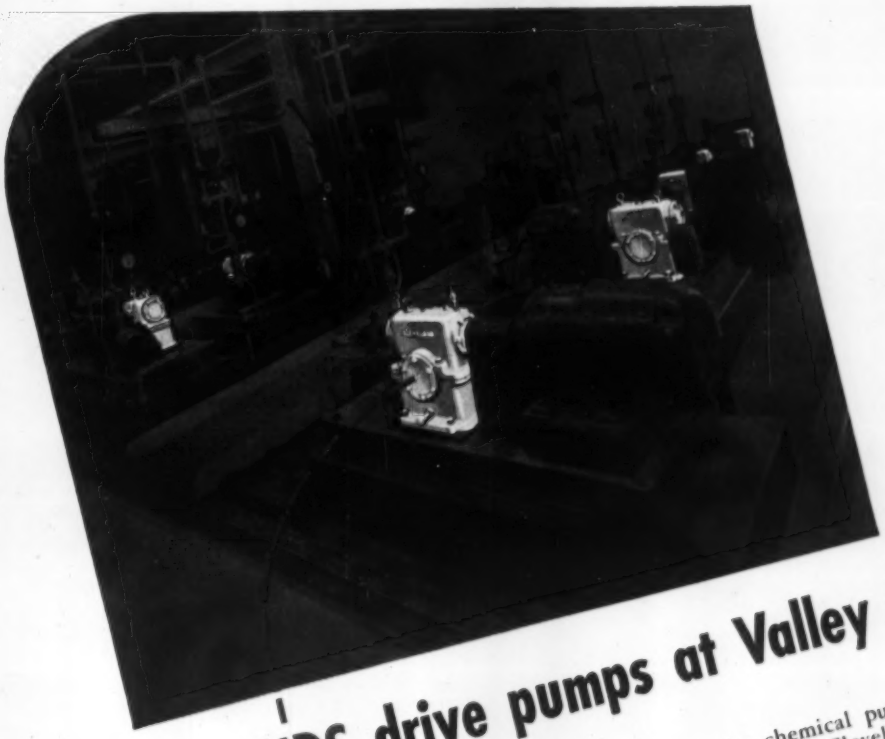
Bethlehem's merchant mills at Lackawanna, N. Y., and Johnstown, Pa., produce hot-rolled bars for a wide range of industries.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



A chemical pump room of 80 million dollar Valley Steam Plant of the Los Angeles Department of Water and Power.

10 CLEVELANDS drive pumps at Valley Steam plant

PLAYING an important role in the chemical pump room of the Valley Steam plant are 10 Cleveland Worm Gear Speed Reducers. In this capacity, these Clevelands provide Milton Roy pumps with the variation of stroking speeds necessary to insure accurate control of proportioning and volume of chemicals used to treat the water to prevent scale and corrosion.

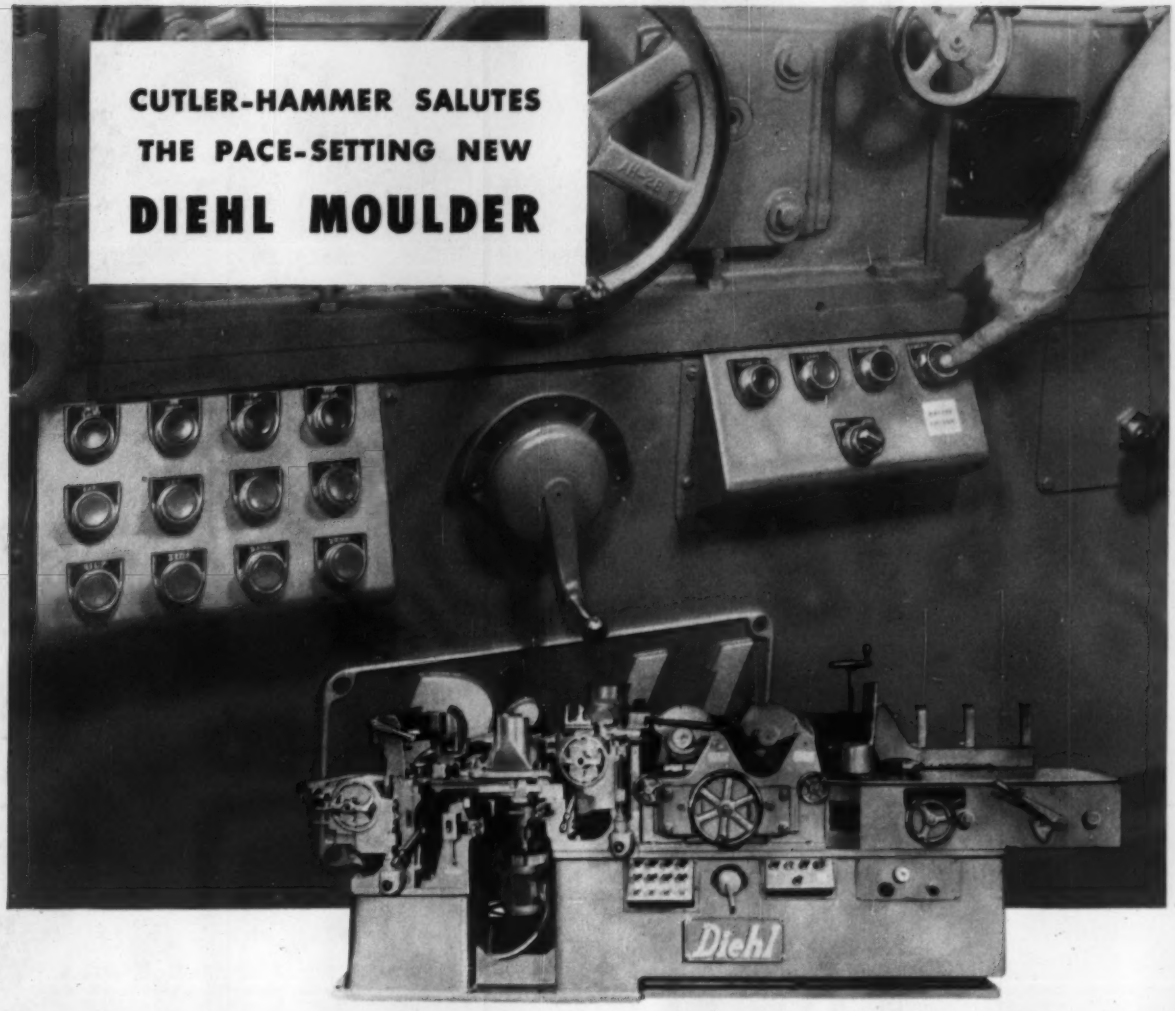
Notice how Cleveland worm gear units take up a minimum of space. And, power is transmitted with a smooth, uniform torque flow. Case-hardened steel worms mesh with nickel-bronze gears for long, hard, dependable service without appreciable wear.

You'll find Clevelands throughout the chemical and allied industries—driving pumps, agitators, mixers—in fact, every kind of equipment for which a right-angle drive is needed.

If yours is a power transmission problem, you can get help by writing for Catalog 400. It gives the full story. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers



The New Diehl 12" Moulder

Cutler-Hammer Three-Star Motor Control is featured. More than twenty such components are standard equipment on the compact control panel of each machine. All pushbuttons for control of the machine's functions are the new Cutler-Hammer Heavy Duty Oil-Tight Pushbuttons.

The G. M. Diehl Machine Works, Inc., Wabash, Indiana has long been recognized as a leading manufacturer of dependable woodworking machinery. Dependability is important in woodworking machinery. The service is rugged. The conditions under which woodworking machines operate impose many problems not found in other industries.

Cutler-Hammer is proud to salute this fine company for its well-earned reputation . . . and for its latest achievement in advanced engineering, the new Diehl 12" Moulder.

Typical of the leadership shown in the design of the new Diehl 12" Moulder is the motor control used. Cutler-Hammer Three-Star Motor Control is featured. More than twenty such components are standard equipment on the compact control panel of each machine. All pushbuttons for control of the machine's functions are the new Cutler-Hammer Heavy Duty Oil-Tight Pushbuttons. By all comparisons, this is the finest electrical equipment available . . . the natural choice wherever precise performance and dependability are basic design objectives. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

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